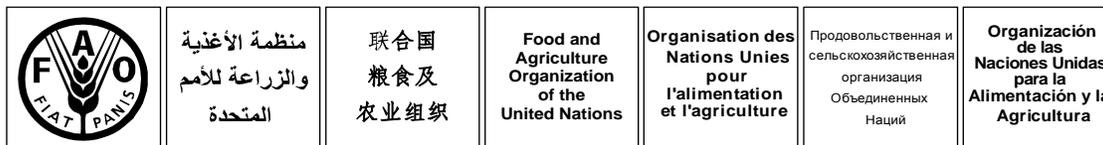


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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 4 of the Provisional Agenda
Intergovernmental Technical Working Group on Forest Genetic Resources
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REVIEW OF PRIORITY AREAS FOR ACTION AND OPTIONS FOR FOLLOW-UP TO <i>THE STATE OF THE WORLD'S FOREST GENETIC RESOURCES</i>

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I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (the Commission), at its Twelfth Regular Session, requested FAO to prepare *The State of the World's Forest Genetic Resources* (the Report), for consideration at its Fourteenth Regular Session, as the first authoritative assessment of forest genetic resources (FGR) of importance to sustainable forest management, food security, poverty alleviation, biodiversity conservation and environmental sustainability.¹ The Commission also endorsed the outline of the Report and adopted the Strategic Plan 2010–2017 for the implementation of the Multi-Year Programme of Work, which contains an indicative timetable for the preparation of the Report.²
2. The FAO Conference, at its Thirty-sixth Session, supported the request of the Commission to prepare the Report as a contribution to its agreed work plan.³
3. At its Thirteenth Regular Session, the Commission urged donors and relevant international organizations to make available extra-budgetary financial resources and in-kind support for the preparation of Country Reports, including for national and regional consultations. It also urged countries to nominate National Focal Points in order to ensure the timely delivery of the Country Reports. While the Commission stressed the need for countries to prepare and deliver their Country Reports on time based on the guidelines provided by FAO, in order for them to contribute to the Report, it also agreed to move the deadline for submission of Country Reports to 1 January 2012. The Commission invited countries to integrate the timely preparation of Country Reports on FGR, as well as any follow-up activities, into their National Biodiversity Strategies and Action Plans.⁴
4. The Commission requested its Intergovernmental Technical Working Group on Forest Genetic Resources (Working Group) to meet, subject to the availability of extra-budgetary funds, prior to the Commission's Fourteenth Regular Session, to review the draft Report and priority areas for action, as identified in Country Reports and regional consultations; and to review and evaluate options for a follow-up, and make recommendations to the Commission.⁵
5. This document briefly describes the process used to identify priority areas for action and options for follow-up to the Report. Draft *Strategic Priorities for Action for the Sustainable Development and Conservation of Forest Genetic Resources*, developed on the basis of regional consultations and available country reports, are provided in *Appendix 1*.

II. IDENTIFICATION OF PRIORITY AREAS

6. Between July and October 2012, FAO convened eight regional consultations⁶ to identify needs and priorities in the follow-up to the Report:

- **Western Africa**, held in Ouagadougou, Burkina Faso, 2–6 July 2012;
- **North Africa and the Near East**, held by FAO in Tabarka, Tunisia, 16–18 July 2012;
- **Central Asia**, held in Dushanbe, Tajikistan, 27–29 August 2012;
- **Pacific**, held in Nadi, Fiji, 4–6 September 2012;
- **Central Africa**, held in Libreville, Gabon, 7–8 September 2012;
- **Asia**, held in Kuala Lumpur, Malaysia, 12–14 September 2012;

¹ CGRFA-13/11Report, paragraph 49.

² CGRFA-13/Report, *Appendix G*.

³ C 2009/REP, paragraph 77.

⁴ CGRFA-13/11/Report, paragraph 67.

⁵ CGRFA-13/11/Report, paragraph 69.

⁶ <http://www.fao.org/forestry/fgr/81076/en/>

- **Eastern and Southern Africa**, held in Nairobi, Kenya, 17–19 September 2012;
- **Latin America**, held in Santiago, Chile, 15–17 October 2012.

7. The regional consultations allowed countries to exchange scientific and technical views and to share information and key findings from the Country Reports in order to identify needs and priority areas for action for the sustainable use, management and conservation of FGR in their respective regions. In support of the regional consultations, relevant information was also extracted from the 69 Country Reports that had been received by FAO as of 30 October 2012.

8. The strategic priorities for action are grouped in four priority areas:

- 1) Improving the availability of, and access to, information regarding FGR ;
- 2) *In situ* and *ex situ* conservation of FGR;
- 3) Sustainable use, development and management of FGR;
- 4) Policies, institutions and capacity building.

9. Table 2 of *Appendix 1* indicates the levels (national, regional or international) at which the main focus of each strategic priority may lie. It should be borne in mind that each country in implementing the strategic priorities, will need to set its own specific priorities in line with its overall national policies and development frameworks.

III. GUIDANCE SOUGHT

10. The Working Group may wish to:

- i. Review, and revise as necessary, the draft *Strategic Priorities for Action for the Sustainable Use, Development and Conservation of Forest Genetic Resources*, as given in *Appendix I*, for submission to the Commission, and recommend that the Commission finalize and submit them to the FAO Conference, for adoption; and
- ii. Provide advice to the Commission on the development of a mechanism for the effective implementation and monitoring of the *Strategic Priorities for Action for the Sustainable Use, Development and Conservation of Forest Genetic Resources*.

Appendix 1

DRAFT STRATEGIC PRIORITIES FOR ACTION FOR THE SUSTAINABLE USE, DEVELOPMENT AND CONSERVATION OF FOREST GENETIC RESOURCES

Introduction

11. Forest covers about 31 percent of the world's total land area with 93 percent being natural forest and only 7 percent planted. Estimates of the number of tree species vary from 80 000 to 100 000. Forest ecosystems remain essential refuges for biodiversity, and 12 percent of the world forest land is designated primarily for the conservation of biological diversity. Approximately 14 million people worldwide are formally employed in the forestry sector. Many more depend directly on forest and forest products for their livelihoods. In developing countries, wood-based fuels are the dominant source of energy for more than 2 billion poor people. In Africa, over 90 percent of harvested wood is used for energy. Wood is not the only resource taken from forests. About 80 percent of people, in developing countries, use non-wood forest products to meet their health and nutrition needs and for income.

12. The contribution of forests and trees to meeting the present and future challenges of food security, poverty alleviation and environmental sustainability depends on the availability of rich diversity between and within tree species. Genetic diversity is needed to ensure that forest trees can survive, adapt and evolve under changing environmental conditions. It also maintains the vitality of forest and provides resilience to stresses such as pest and diseases. Furthermore, genetic diversity is needed for artificial selection, breeding and domestication programmes for the development of adapted varieties or to strengthen useful traits. In many countries, the prospects for sustainable development in rural areas will be greatly influenced by the state of diversity in forest ecosystems and species.

13. Efforts to sustainably manage FGR at international as well as at national levels need to rely on solid and coherent baseline information. The country reports on State of Forest Genetic Resources as developed following the FAO guidelines are the main source of comparable information. It is also the basis for the identification of the priority areas for actions on FGR.

The Strategic Priorities for Action

14. Conserving forest genetic resources (FGR) is vital, as they are a unique and irreplaceable resources for the future. FAO has for many decades acknowledged their importance. Already in 1967, the FAO Conference recognized that forest genetic diversity was increasingly being lost, and requested the establishment of the Panel of Experts on Forest Gene Resources (the Forest Gene Panel), to help plan and coordinate FAO's efforts to manage the genetic resources of forest trees.

15. FAO's activities on FGR are an integral part of the FAO Forestry Programme, and contribute to other programme components, such as Global Forest Resources Assessment, national forest programmes, sustainable forest management, tree breeding and plantation development, and protected area management. For many decades, the Forest Gene Panel has guided FAO's work on FGR, reporting on progress made to the Committee on Forestry (COFO).

The rationale for strategic priorities for action for the sustainable use, development and conservation of forest genetic resources

Key features of forest genetic resources

16. Most forest tree species are wild, managed in natural ecosystems, or are at a very primitive stage of selection or domestication as compared to agricultural crops⁷
17. Forest tree species are typically long-lived, highly heterozygous organisms, which have developed natural mechanisms to maintain high level of intraspecific variation, such as a high rate of out crossing, and dispersal of pollen and seeds over a wide areas. These mechanisms, combined with native environments that are often variable in both time and space, have contributed to the evolution of forest tree species into some of the most genetically variable organism on earth⁸. In situ conservation allowing dynamic maintenance of the genetic diversity and processes is the preferred approach for forest species, while ex situ conservation most commonly used for domesticated plant species.
18. Trees have multiple functions by providing numerous products and services About 80 percent of people in the developing world use non-timber forest products for health, nutrition and income.
19. Quantifying the value of the benefit derived from FGR is difficult for several reasons. Apart from timber, most forest products are harvested for local consumption or commercialized without proper national monitoring and documentation. This is particularly the case in developing countries.
20. In term of their present or potential contribution to food security and environmental sustainability, FGR are underutilized and undervalued.
21. Knowledge of FGR is usually scattered and detained by different institutions in unpublished reports, with limited access in most countries. Baseline information, such as country species checklists, species distribution maps and forest reproductive material catalogues, are lacking.
22. The number of known forest tree species exceeds 80 000, but current efforts in member countries to test and improve forest species focus on approximately 450 species.

Aims of the strategic priorities for action

The main aims of the strategic priorities for action are:

- to strengthen understanding and knowledge of FGR;
- to promote the sustainable use and management of FGR;
- to develop and strengthen *in situ* and *ex situ* FGR conservation programmes through collaboration at national, regional and global levels;
- to promote access to, and sharing of, information on FGR at regional and national levels;
- to create and strengthen national programmes to increase regional and international cooperation, including in research, education and training on the use and sustainable management of FGR, and to enhance institutional capacity.
- to assist countries, as appropriate, to integrate FGR conservation and management needs into wider national policies and programmes and frameworks of action at national, regional and global levels;
- to promote the assessment of FGR-related traditional knowledge, innovations and practices , the equitable sharing of benefits arising from their use, the recognition of their

⁷ National Academic Press (1991). Managing global genetic resources, Forest Trees. Pp 229

⁸ FAO, FLD, IPGRI. 2004. Forest genetic resources conservation and management. Vol 1: Overview, concepts and some systematic approaches. International Plant Genetic Resources Institute, Rome, Italy. Pp 106.

roles, and, where appropriate, the putting in place of effective policies and legislation addressing these matters;

- to promote adequate access to, and use of, quality forest reproductive material to support research and development programmes at national and regional levels;
- to promote ecosystem and ecoregional approaches as efficient means of promoting sustainable use and management of FGR;
- to assist countries and institutions responsible for the management of FGR to establish, implement and regularly review national priorities for the sustainable use and management of FGR; and
- to strengthen national programmes and enhance institutional capacity – in particular, in developing countries and countries with economies in transition – and develop relevant regional and international programmes. Such programmes should include education, research and training to address the characterization, inventory, monitoring, conservation, development and sustainable use of FGR.

23. The strategic priorities for action are based on the assumption that countries have sovereign rights over their natural resources, including FGR, and that substantial international cooperation is necessary in the management of FGR. In this context, the strategic priorities for action were developed on the basis of the following principles:

- Genetic diversity is the mainstay of biological stability; it enables species to adapt to changing environments, including the effects of climate change and emerging diseases. It is the basis for present and future selection and breeding programmes. In addition to their irreplaceable contribution to environmental sustainability, FGR provide a direct food source for human and animals, even at times when annual crops fail.
- Inventory, characterization and monitoring are necessary to generate the knowledge needed for proper understanding of trends in the status of FGR and to enable adequate decision-making in the sustainable management and use of FGR.
- In situ conservation is the most widespread conservation practice, because most forest species grow wild and are not being domesticated. It also allows species populations to continue to be exposed to evolutionary processes.
- The effective management of FGR, at all levels, depends on the inclusion and willing participation of all relevant stakeholders. Appropriate participatory processes, that ensure that the interests of different stakeholders are respected and balanced, are required.
- Strengthening efforts to develop institutional partnerships within and among countries is essential, given that species distributions and ecosystems boundaries do not respect country borders. Strong partnerships and collaboration at different levels are needed in order to improve awareness and develop appropriate national and international regulations and policy tools that lead to sound technical and scientific programmes at national, regional and global levels.

24. Resource mobilization to allow timely and adequate implementation of the strategic priorities requires due attention and efforts at all levels, including coordination with the numerous initiatives underway within countries, regionally and globally (Convention on Biological Diversity, Global Environment Facility, etc).

Structure and organization of the strategic priorities for action

25. The strategic priorities for action are often closely related and interlinked. Many of the actions foreseen are relevant to more than one priority, in four priority areas:

- 1) Improving the Availability and Access to Information on FGR
- 2) Conservation of FGR (in situ and ex situ)
- 3) Sustainable use, development and management of FGR
- 4) Policies, Institutions and Capacity building

STRATEGIC PRIORITIES FOR ACTION

Priority Area 1: Improving the Availability of, and Access to, Information on FGR

Introduction

It is recognized that reliable data on forest status and trends are of great importance to the efficient management of FGR. However, currently available forest-related information largely relates to forest resources in general rather than to forest diversity and variation in tree species. Availability of specific information on the status and trends in FGR is today inadequate, although some progress has been made at national and subregional levels during the last decade.

Availability of, and access to, quality and updated information on FGR is reported to be poor in many countries. Most Country Reports highlight the need to promote awareness among decision-makers and the general public of the importance of FGR and their roles in meeting present and future development needs. Lack of information limits the capacity of countries and the international community to integrate FGR management into cross-cutting policies.

Gaps in information related to FGR include the following:

- in many countries, a lack of an updated species check list;
- a lack of an accurate global picture of the status and trends of FGR;
- a lack of a comprehensive assessment of national and international capacities to manage FGR;
- a lack of an accepted methodology for directly linking general information on changes in forests to their impacts on biological diversity, species, (provenances), populations and genetic variation.

These deficiencies complicate global monitoring of the status and trends of FGR and limit capacity for effective decision- making and action at national and international levels.

In many countries, there is an important relationship between the use and management of FGR and traditional knowledge. This valuable knowledge supports the livelihoods of local communities in many developing countries, while representing a tremendous asset for industrial and trade development in sectors such as pharmacy, food, biopesticides. Policies on FGR information management should take these important roles into consideration. Traditional knowledge is under threat as a consequence of FGR degradation and changes in land use and sociocultural practices.

Long-term goal

Improved availability and accessibility of knowledge and information on species and their genetic diversity, forest ecosystems and related traditional knowledge, to facilitate and enable decision-making on sustainable use and management of FGR and to enhance their contribution to solving serious global problems such as food shortage, land and water degradation, the effects of climate change, and the increased demand for various forest products and services.

NATIONAL LEVEL

Strategic Priority 1.

Establish and strengthen national FGR assessment, characterization and monitoring system:

Rationale: Information on FGR is inadequate in many countries. National forest inventories do not usually include the parameters needed for planning the sustainable management of FGR. Baseline information on the status, trends and characteristics of FGR is needed in order to allow the definition and regular review of priorities for sustainable use and conservation, as well as the development of tree domestication and improvement programmes.

Action: Promote species inventory and characterization. Promote mapping of the distribution of priority or important species populations. Reinforce the capacities of **national herbaria and botanic survey** to support the development of knowledge on forest species.

Develop **technical standards, protocols and documentation systems** for assessing and monitoring the status of FGR management. Promote and support the development of **national and regional species checklists** and mechanisms for updating them regularly.

Develop networks of forest gene banks, information units and databases, and enhance information management and sharing at national and international level.

Strategic Priority 2

Develop national systems for the assessment and management of traditional knowledge on FGR

Rationale: **Traditional knowledge** can make a significant contribution to sustainable development through practices such as local conservation and sustainable use of plants and can contribute to efforts to solve serious global problems such as climate change, desertification and land and water degradation. There is therefore a need to secure traditional knowledge of FGR by developing national assessments and improving documentation.

Action: Promote national-level assessments and documentation of traditional knowledge related to the use and management of FGR by local communities.

Develop national traditional knowledge registration mechanism and databases to preserve, protect, and promote traditional knowledge on FGR.

INTERNATIONAL LEVEL**Strategic Priority 3****Develop international technical standards and protocols for FGR inventories, characterization and monitoring of trends and risks**

Rationale: Scientifically sound, realistic and policy-relevant indicators for defining a baseline and monitoring the status and trends of FGR and their management are lacking at global, regional and national levels. There is a need for to develop and use standardized methods and protocols for inventory, characterization and monitoring. There is also a need to enhance the coordination of research on the identification, mapping and characterization of species populations and to improve the impact of the results in FGR management policies.

Action: Develop global criteria and indicators for assessing the status and trends of FGR within national forest inventories and others forest-related programmes.

Develop protocols for participatory assessment and monitoring of FGR.**Strategic Priority 4****Establish and reinforce FGR information systems (databases) to cover available scientific and traditional knowledge on uses, distribution, habitats, biology and genetic variation of species and species populations.**

Rationale: *The State of the World's Forest Genetic Resources* provides the first global overview of the diversity, status and trends of FGR and of national regional and global capacity to manage these resources. Many Country Reports indicate that there are important gaps in knowledge of FGR and that information at country level is scattered and difficult to access. Furthermore research programmes suffer lack of adequate financial support in many developing countries. There is therefore an urgent need to improve access to information on FGR for all stakeholders, while also developing the knowledge base required for sustainable use and management of FGR. There is also a need to improve countries' financial support to research activities.

Action: Improve access to information by developing and strengthening information management and sharing mechanisms at national and global levels.

Establish and maintain FGR databases at national, regional and global levels.

Improve access to information on forest species for a wide range of stakeholders, including local populations.

Priority Area 2: In situ and ex situ conservation of FGR

The development of a worldwide conservation strategy for FGR is based on the need to maintain the adaptive and neutral genetic diversity of forest trees and shrubs. This goal can be met by applying *in situ* conservation methods across tree species distribution ranges.

Regional collaboration through species or thematic networks should play an important role in implementing the strategy and monitoring the progress made. This collaboration should aim to facilitate the use of ecosystem approach and to promote greater awareness of the different forest and tree management types (Table 1) and the different levels of genetic conservation.

Table 1: The main types of forest and tree resources management

Naturally regenerated forests		Planted forests				Trees outside forests, and agroforestry systems
Primary	Modified natural	Semi-natural		Plantations		
		Assisted natural regeneration	Planted component	Productive	Protective	
Forests of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed	Forests of naturally regenerated native species where there are clearly visible indications of human activities	Silvicultural practices in natural forest by intensive management: <ul style="list-style-type: none"> • weeding • fertilizing • thinning • selective logging 	Forests of native species, established through planting or seeding intensively managed	Forests of introduced and/or native species established through planting or seeding mainly for production of wood or non wood goods	Forests of introduced and/or native species, established through planting or seeding mainly for provision of services	Stands smaller than 0.5 ha; tree cover in agricultural land (agroforestry systems, home gardens, orchards); trees in urban environments; and scattered along roads and in landscapes

Protected areas are established, regulated and managed to achieve conservation objectives in the context of a growing pressure from the harvesting of forest resources and the conversion of forests to other land-use types. They mostly serve as a refuge for species that are unable to survive in intensely managed landscapes. National programmes for the sustainable use and management of FGR should therefore take the important roles of protected areas into account, although most of them may have been primarily design for purposes such as wildlife (mostly animals) protection, recreation and various ecosystem services

Protected areas are suitable for the conservation of viable forest tree populations of diverse species and of representative ecosystem samples, as well as for maintaining vital ecosystem services.

Marginal and/or range limits⁹ tree species populations may be key in providing adaptation to the novel environmental extremes that are expected to occur as a result of rapid climatic change. It is necessary to understand the dynamics of marginal forest species populations through adequate examination of adaptive genetic variation in quantitative traits. Furthermore conservation in the current climate change context requires accurate estimates of the positions of future extreme environmental conditions (range limits). Modelling of species distribution dynamics needs to account for changes in species' distribution areas and in those of their associated environment correlates (e.g. pollinators) and also the possible influences of interactions with other plant or animal species.

Adequate *in situ* conservation measures are needed to preserve the natural growing conditions of the tree species in order to study and better understand their evolutionary process and adaptation to changes. Information from *in situ* conservation activities for marginal and/or range limits populations will be essential in providing options for adaptation to climate change.

On-farm management of FGR, including agroforestry systems, is identified as one of the important land use types that contribute substantially to *in situ* conservation of FGR, particularly domesticated or semi-domesticated species (e.g. the agroforestry parkland system in West Africa).

Many priority species identified in Country Reports from semi arid zones are trees growing on farmlands, including agroforestry systems. Most of them are indigenous species that have been traditionally managed by farmers for centuries.

Tree diversity in farmland varies from few species a few tree species in some countries to more 100 some others. Some of these species are semi-domesticated species that occur only in agroforestry systems. Sustainable management of the agroforestry systems is therefore needed in order to conserve the genetic resources of the species.

Given the important number of tree species recorded worldwide as mentioned earlier in the document, it is clear that there is a need for **priority setting** among the many alternative species that might be targeted for action. Priority setting is complicated greatly by the lack of basic information on the variation, variation patterns and potentialities of many tree species.

The general aim of priority setting is to compare the consequences and trade-offs of a range of actions. It implies that some areas, species or genetic resources will be given lower priority than others. When different stakeholders have similar priorities, concerted action on the part of these stakeholders is possible. When their priorities are dissimilar, independent but harmonized action is more likely to succeed. It is likely that among governmental, non-governmental and international organizations active in forest biological diversity and genetic conservation, substantial differences will exist in terms of priorities, as well as in terms of their capabilities to implement various management techniques. Where such differences exist, it will be necessary to form coalitions for action, operating under coherent frameworks and at appropriate levels.

Commitment at national and local levels to specified objectives and priorities is a prerequisite for the implementation of sustainable conservation programmes. Governments have worked towards ensuring a wide ownership of their Country Reports by organizing stakeholder workshops to review

⁹ Sexton al (2009) in *Annu. Rev. Ecol. Syst.* 40:415-36

and validate the reports. During regional consultations in the Near East and North Africa, West Africa, Central Asia, Asia, Pacific, Central Africa, East and Southern Africa and Latin America, regional priorities for action were identified. In many cases regional priority species were discussed. However, the process needs to be continued in order to define the detailed actions for each species and to allocate responsibilities among actors and partners at national, regional and international levels.

Long-term goal

Maintain genetic diversity and ensure evolutionary processes of forest species by better implementing and harmonizing measures to conserve forest genetic resources, both *in situ* and *ex situ*, including through regional cooperation and networking.

NATIONAL LEVEL

Strategic Priority 5

Strengthen the contribution of protected areas to *in situ* conservation of FGR

Rationale: In the current context of increasing pressure on forest land and forest resources, protected areas remain the best refuges for threatened FGR. An important proportion of wild and/or endemic plants occur only in protected forest areas. Natural processes involved in the dynamics of FGR resources are better assessed and understood in protected natural forests, which remain the best laboratories for studying species ecology and biology. The contributions of protected areas to the development of knowledge on plant species and to conservation of FGR, therefore, need to be promoted.

Action: Develop collaboration between institutions or programmes in charge of protected forest areas and those responsible for the development and use of FGR, such as national tree breeding centres, tree seed centres and other germplasm collection and conservation institutions operating at national or regional levels.

Promote and reinforce development of national FGR assessment and conservation activities in **protected areas** and in **conservation forests**.

Strategic Priority 6

Support assessment, management and conservation of Marginal and/or range limits Forest Species Populations

Rationale: Marginal forest species populations are fragile and more inclined to degradation than central populations, because they have less variation. Genetic drift can have a significant effect on the genetic structure of marginal populations and lead to strong selection and to the presence of special genetic adaptation features. Marginal populations should therefore have high priority in global and regional conservation strategies and programmes.

Strategic Priority 7

Action: Develop guidelines for the inventory and documentation of marginal forest species populations and promote their management and conservation through integration in conservation networks and by emphasizing the participation of local communities.

Support programme development at global and regional levels to assess marginal populations and promote their conservation and evaluation in both *in situ* and *ex situ* conditions.

Support and develop sustainable management and conservation of FGR on farmland

Rationale: Farmers contribute to FGR **management and conservation on-farm** in traditional land-use systems such as **agroforestry systems**. **They therefore influence interspecific and intraspecific diversity of species in the landscape**. FGR managed in traditional agroforestry systems are seriously threatened by a lack of regeneration resulting from the increasing pressure on forest resources and current trends in agricultural intensification. There is a need to address the issue of on-farm management of FGR in countries where agroforestry a common practice.

Action: Develop methodological tools for on-farm management and conservation of important agroforestry species.

Assess the status of conservation and management of important agroforestry species at national and regional levels.

Provide technical support to promote on-farm sustainable management and use of FGR.

Strategic Priority 8**Identify priority species for action**

Rationale: Because of the complexity of the subject, FGR management is better handled using a species approach. Processes involved in genetic diversity dynamics determine species adaptation and performance in a given environment. Understanding and developing FGR using a species approach is regarded as a more adequate and useful option. Given the high number of forest species present in each country, it is impossible to develop research activities or programmes for all forest species. Priority species should be identified at country, regional and international levels so as to provide better focus and more efficient resource use.

Action: Promote research networks focusing on important species at national, regional and international levels.

Update priority species lists regularly at both country and regional levels.

Provide international support for the development of guidelines for species prioritization and for the identification of priority areas of research.

REGIONAL LEVEL

Strategic Priority 9

Develop and implement regional *in situ* conservation strategies and promote eco-regional networking and collaboration

Rationale: The ecosystem approach is a way to manage entire ecosystems in a holistic manner without excluding other management and conservation approaches such as area-based management tools and single-species conservation practices. Ideally all these approaches should be integrated, through regional networks when appropriate.

Regional strategies for conservation of forest genetic resources, including regional networks of *in situ* genetic conservation units of priority species are needed to ensure the dynamic conservation of key forest genetic resources and their evolutionary ability for the future. Definition and implementation of regional conservation strategies provide a good justification for coordination and collaboration at regional level. Investment in joint activities regional level may often be more efficient and cost-effective than the multiplication and duplication of activities at national level.

Action: Development of methodologies for preparation of regional strategies for conservation of forest genetic resources, including principles for their implementation, taking into account existing experience and using existing regional networks relevant to FGR.

Promote ecosystem-based partnership and regional collaboration to develop species genetic resources conservation and evaluation programmes (*in situ* and *ex situ*) in line with commitments under existing international regulations.

Mobilize resources by involving existing regional economic organizations.

Priority area 3: Sustainable use, development and management of FGR

The challenge of achieving food security for all and environment sustainability in the context of the combined effects of climate change and the increasing human pressure on forests is greater now than it has ever been. More efficient use and management of available forest resources is therefore needed, especially in tropical and less-developed countries, in order to meet the growing demand for forest goods and services.

To ensure sustainable management of forests, the genetic resources of forest trees must be conserved and developed, whether they exist as trees in planted forest, in natural forest or protected conservation stands, or as seeds or tissue cultures in storage. Managing FGR involves developing overall strategies, applying specific methodologies, developing and applying new technologies, and coordinating local, national, regional and global efforts¹⁰

Monitoring forest biological diversity and managing FGR requires reliable information on the status and trends of these resources. There are no common standard methods for measuring changes in the status of FGR in relation to sustainable forest management as undertaken in most countries.

Parameters commonly included in national and global forest resources assessments, such as forest area, species occurrence and richness and forest fragmentation, are not on their own able to provide information on FGR. Adequate and commonly agreed indicators are needed and should be integrated into the national forest assessment policies and monitoring tools.

Many countries face difficulties in getting the quantities and quality of forest reproductive material needed to implement their plantation programmes. Lack of an efficient tree seed supply system has been reported as a bottleneck for national afforestation programmes by many countries. Furthermore, using improved forest reproductive material can be expected to provide a substantial production gain. Efforts should therefore be made to support the seed supply system.

Long term goal

Enhance sustainable use, development and management of FGR, as a key contribution to environmental sustainability, food security and poverty alleviation.

NATIONAL LEVEL

Strategic Priority 10

Develop and reinforce national seed programmes to ensure the availability of tree seeds in the quantities and of the (certified) quality needed for national plantation programmes

Rationale: Countries reported that large plantations areas are being established to serve many purposes, including the production of timber biofuel and fibres and the provision of various environmental services such as reclamation of degraded land and soil and water management. However, most developing countries lack adequate forest seed supply

¹⁰ National Academic Press (1991). Managing global genetic resources, Forest Trees. Pp 229.

systems. This jeopardizes the success and performance of plantation programmes in these countries. This concern is highlighted in most Countries Reports and was identified as a priority area for action by most regional consultations.

Action: Promote the establishment of, and support to, national tree seed supply systems.

Enhance **collaboration** between tree seed centres, and **develop common quality seed standards**, to facilitate forest reproductive material exchange within regions and support national afforestation programmes.

Strategic Priority 11

Support climate change adaptation and mitigation through proper management and use of FGR

Rationale: The current growing concern about climate change and its effects on ecosystems and the performance of forest-related production systems, challenges stakeholder in FGR management to better understand forest species and mechanism for adaptation to current and future climate changes. Genetic diversity is needed in order to ensure that species can adapt as well as to allow for artificial selection and breeding to improve productivity. Thus biological diversity, including FGR, is the key to the resilience of forest ecosystems and the adaptation of forest species to climate change.

Action: Develop standard methods and guidelines for the identification and selection of species population conservation units, based on environmental and sociocultural factors, which are the main determinants of the status of forest and agroforestry ecosystem diversity.

Support countries in their efforts to improve the conservation and sustainable use of biological diversity in the face of climate change by:

- promoting best practices in FGR management, specifically in the fields of conservation, exploration, testing, breeding and sustainable use; and
- promoting FGR's contribution to environmental sustainability through development and use of well- suited genetic material.

Strategic Priority 12**Promote use of emerging technology to support the conservation development and sustainable use of FGR**

Rationale: Tree improvement activities remain limited to a few economically important tree species, not only because of the financial constraints but also because of their specific characteristics. Trees are long lived perennial species, with long regeneration cycles and late sexual maturity. Because of these characteristics, improvement and breeding research in tree species require more time than is required for the equivalent activities in other crops.

New technologies, such genetic markers and micro-propagation, can

help accelerate the selection process and unlock the huge potential of forest trees.

Action: Promote the use of emerging technology to support tree improvement programmes and enhance the use of quality FGR in forestry programmes.

Assess available technologies and their effectiveness for use in *in situ* and *ex situ* conservation and in the development of the genetic resources of priority species.

Promote marker assisted selection in improvement programmes for priority tree species.

Strategic Priority 13.**Develop and reinforce research programmes on tree breeding, domestication and bioprospection in order to unlock the full potential of FGR**

Rationale: In addition to timber, forests provide many other commodities that are important to local communities and to national economies. The importance of medicinal plants, fodder plants and food plants is increasingly recognized and strongly reflected in many Country Reports. In developing countries, 80 percent of the population rely on medicinal plants for their health care. Free grazing is still a common practice in many developing countries, and forests are often an essential source of fodder. These various resources are still harvested from wild plants that in forest lands and in some cases are under threat due to over-exploitation. Domestication of such plants will improve the supply of the targeted products while reducing the vulnerability of their genetic resources.

Action: Assess and evaluate the contributions of forest species to environmental services (soil and water conservation, carbon sequestration, .etc.).

Assess and evaluate the contributions of priority forest species to important national production sectors (timber, fruits, fodder, vegetable oil, vegetable, medicines, etc.).

Develop programme-based multi-purpose tree breeding for priority species.

Promote participatory approaches by involving local communities in selection and breeding programmes for priority species, based on farmers' desired traits.

INTERNATIONAL LEVEL

Strategic Priority 14

Develop networking and collaboration to combat invasive and alien species as well as diseases and pests affecting FGR.

Rationale: Invasive species are increasingly being noted as major threats to FGR. The major threats come from “transformer” plant species, which have the capacity to invade natural and/or slightly disturbed forest associations and become predominant, often displacing whole ecosystems and species. Pest and diseases affecting forest and trees are predicted to become an increasing threat as the effects of climate change become more prominent and the movement of plant material across countries and continents accelerates.

Action: Establish standards for the movement of forest plant material across countries and regions to avoid the spread of pathogens.

Develop protocols and promote national global assessments of invasive alien species and their effects on FGR, using a regional or ecosystem approach.

Review national biosecurity regulations, where appropriate, amend them to integrate concerns about FGR.

Priority area 4: Policies, institutions and capacity building

In many cases, national policies and regulatory frameworks for FGR are partial, ineffective or inexistent given the fact that FGR is not commonly well understood and properly dealt with in many countries. Awareness building at all levels will be a key factor in mobilizing popular support and international collaboration for the implementation of the Strategic priorities for Action.

There is an increasing demand for forest products including round wood, fire wood and non wood forest products (NWFP) in many countries. Country data reported in the Global Forest Assessment 2010 showed that the value of NWFP is some times higher than round wood and firewood when information is available. Sound social and economic policies are needed at national and global levels to ensure integration of FGR in wider national forest policy frameworks and global initiative such as FRA for sustainable management of FGR.

In many developing countries, lack of trained personnel – both in terms of numbers and in terms of skills to address FGR management in a time of rapid social and economic change – is a major impediment to developing and implementing FGR policies, strategies, programmes and projects. Education and training in order to build sustainable capacity in all priority areas is required.

Institutional strengthening, training and support to research, are needed for countries to be able to respond to pressing and increasingly varied needs in conservation and FGR management. This includes promotion of training and research at national and international level in aspects related to recent development on Forest Genetic Resource Management. The role of National Research Systems and programmes including Tree Seed Centers and their support by the CGIAR system is crucial in this context.

In the context of scarce resources and a great risk of duplicating the same activities at national or regional levels, efforts should be made to promote partnership and coordination at national, regional and international levels when appropriate. Promotion of Networking should also be encouraged in linking stakeholders, and in supporting institutional development and capacity-building.

Long term goal

Establish and review relevant policies and legal frameworks to integrate major issues related to sustainable FGR management and strengthen institutional and human capacity to achieve the successful medium and long-term planning of the forestry sector in member countries as well as for the long-term sustainable use, management and conservation of FGR.

NATIONAL LEVEL

Strategic priority 15

Update and Integration of FGR conservation and management needs into wider national policies and programmes frameworks of action at national, regional and global level (eg FRA,).

Rationale: Many countries reported that due to the scarcity of financial and human resources, FGR will be best managed, if the relevant needs and priorities are taken care by wider national forestry and land use programmes and policies (eg national forest inventories, protected areas...).

Strategic priority 16

Action: Promote Review of national policy and legal frameworks on Forest to integrate key concerns on FGR.

Review and align forest and land use policies and programs to better integrate the FGR dimension and contribute to climate change mitigation and adaptation.

Develop collaboration and promote coordination of national institutions and programmes related to FGR (eg CBD)Rationale:

There is a need to build synergy at national level between coordination units and National Focal Points of the different international programmes and conventions to enable efficient information sharing and resource use and for a better support of the national priorities identified on FGR.

Action: Enhance cooperation and synergies between national authorities and National Focal Points in charge of FGR related international programmes and conventions (eg CBD, UNCCD, Climate change, ABS, FRA NFPs, ...).

Create national consultation framework such as permanent national commission for FGR to enhance sustainable management of FGR within national development and research programmes.

Strategic priority 17

Establish and strengthen educational and research capacities on FGR to ensure adequate technical support to related development programmes

Rationale: Technical and scientific capacities on FGR were reported by many countries as weak. University training curricula on issues such as FGR conservation, tree breeding and management of NTFP are rarely available in many countries. Research and education needs strengthening in all areas of management of FGR in most countries in particular in developing countries and countries in economic transition. Establishing, strengthening and maintaining research and education institutions is key to building national capacities to plan implement priorities activities for sustainable use, development and conservation of FGR.

Action: Develop appropriate training modules to support the management and use of forest plants which are important source of NTFP.

Develop needed inter-sector and inter institutional collaboration to make use of available scientific and technical information to ensure appropriate content of the modules.

Organize training workshops on recent technologies and advancements and exposure visits for scientists and technicians.

Strengthen national Research and education programmes and capacity on FGR and promote regional connectivity and collaboration between

institutions.

Reinforce national herbaria capacity and operation to support development of knowledge on species.

Develop training modules/curricula that integrates major and varied concerns on FGR management and sustainable uses. This could lead to:
1) Identify medium and long-term needs for qualified human resources necessary for supporting national development and research activities on FGR. 2) Develop extension and education modules with special emphasis on modern technology (eg biotechnology), to support national education capacity on forestry and FGR management.

Strategic priority 18

Promote participation of the local communities in FGR management in the context of decentralization.

Rationale: Many developing countries have a decentralized country administration or are undergoing decentralization process. Natural resources, including FGR, management should therefore be considered in this perspective for these countries. In some cases regulations measures are decided at province or state level. There is therefore a need to provide appropriate technical support to decentralized administrations in the countries to review or develop policy tools that ensure sustainable use and management of FGR.

Action: Develop or review local policies related to forestry, to increase awareness on FGR among local communities and to properly address the need for sustainable management, development and uses of FGR at decentralized level.

Develop adequate human resources to support ongoing decentralization processes with proper management of FGR and enhance its contribution to local development.

REGIONAL LEVEL

Strategic priority 19

Improve germplasm exchange mechanisms at regional level to support research and development activities

Rationale: Transfer and exchange of Forest Reproductive Material are regulated under international agreements, which, in some cases, can limit access to proper material and subsequently prevent research programmes from delivering the results needed to make good impact.

Strategic priority 20

Action: Improve awareness and understanding of member countries on existing international regulations on genetic material exchange.

In compliance with International Regulations, develop adapted regional Forest Reproductive Material exchange regulations and mechanism to facilitate access of material for scientific work within the region.

Reinforce regional and international cooperation to support research, conservation and sustainable management of FGR

Rationale: One of the most common constraints for research activities on FGR is the lack financial and adequate human resources. It is therefore recommended by member countries to strengthen international and regional cooperation to better support education and research activities.

Action: Identify international channels for financial support (e.g. climate-related funds)

Establish species research networks to share information and experiences.

INTERNATIONAL LEVEL

Strategic priority 21

Establish and Support development and reinforcement of International networking an information sharing on FGR research, management and conservation

Rationale: The need for networking was expressed in most regional consultation workshops as a priority for action, which should improve information and experience sharing between stakeholders at global level.

Action: Establish better linkages and mechanisms to enhance coordination and collaboration between institutions on technology, policy implementation and information sharing.

Strategic priority 22

Promote Public and International Awareness of the roles and values of FGR

Rationale: Many developing countries reported that decision makers and the general public are not well aware of the importance of FGR. Needs and priorities for actions at country, regional and international level will be better supported by stakeholders if effective extension activities are developed and supported.

Action: Develop FGR advocacy measures and tools to ensure effective communication and information sharing related sustainable FGR

management and uses.

Support international campaigns to raise awareness on the status and trends of FGR and its contribution to the Millennium Development goals including food security, poverty alleviation and environment sustainability, and subsequently seek to develop wide support at government and institutional levels as well as among the general public.

Organize training for forestry technicians and administration managers on FGR.

Strategic priority 23

Strengthen efforts to mobilize the necessary resources, including financing for the conservation and sustainable use and development of FGR

Rationale: Most countries reported that FGR conservation, sustainable use and development efforts are lacking adequate funding. Efforts need to be made at national and international level to ensure that strategic priorities are successfully translated into actions within existing and/or new programmes.

Action: Develop efforts to assist countries and stakeholders in designing appropriate programmes and policies for the conservation and sustainable use and development of FGR, to secure adequate funding, particularly in developing countries and countries with economy in transition.

Encourage countries and stakeholders to explore new funding opportunities including Climate change and biodiversity related funds.



	Priority area 1: Improving the availability of, and access to, information regarding FGR	Priority area 2: In situ and ex situ conservation of FGR	Priority area 3: Sustainable use, development and management of FGR	Priority area 4: Policies, institutions and capacity building
National	SP 1. Establish and Strengthen National FGR Assessment Characterization and monitoring system	SP 5. Strengthen the contribution of Protected areas to in situ conservation of FGR	SP 10. Develop and Reinforce National seed programme to ensure availability of the required quantities and quality (certified) tree seeds needed for national plantation programmes	SP 15. Update and Integration of FGR conservation and management needs into wider national policies and programmes frameworks of action at national, regional and global level (eg FRA,).
	SP 2. Develop National systems for the Assessment and management of traditional knowledge on FGR	SP 6. Support assessment, management and conservation of Marginal and/or range limits Forest Species Populations.	SP 11. Support Adaptation and Mitigation of Climate change effect through proper management and use of FGR	SP 16. Develop collaboration and promote coordination of national institutions and programmes related to FGR (eg CBD)
		SP 7. Support and develop sustainable management and conservation of FGR on farm land	SP 12. Promote use of emerging technology to support conservation development and sustainable use of FGR	SP 17. Establish and strengthen educational and research capacities on FGR to ensure adequate technical support to related development programmes
		SP 8. Identify and Priority species for action	SP 13. Develop and reinforce research programmes on Tree breeding, Domestication and Bio prospection to unlock the full potential of FGR.	SP 18. Promote participation of the local communities in FGR management in the context of decentralization

Regional		SP 9. Develop and implement regional in situ conservation strategies and promote eco-regional networking and collaboration		SP 19. Improve germplasm exchange mechanisms at regional level to support research and development activities.
				SP 20. Reinforce regional and international cooperation to support research, conservation and sustainable management of FGR
International	SP 3. Develop international technical standards and protocols for FGR inventories, characterization and monitoring of trends and associated risks		SP 14. Develop networking and collaboration to combat Invasive and Alien Species as well as diseases and pests affecting FGR.	SP 21. Establish and Support development and reinforcement of International networking an information sharing on FGR research, management and conservation.
	SP 4. Establish and reinforce FGR Information System (database) to cover available scientific and traditional knowledge on uses, distribution, habitat, biology, genetic variation, of species and species populations.			SP 22. Promote Public and International Awareness of the roles and values of FGR
				SP 23. Strengthen efforts to mobilize the necessary resources, including financing for the conservation and sustainable use and development of FGR