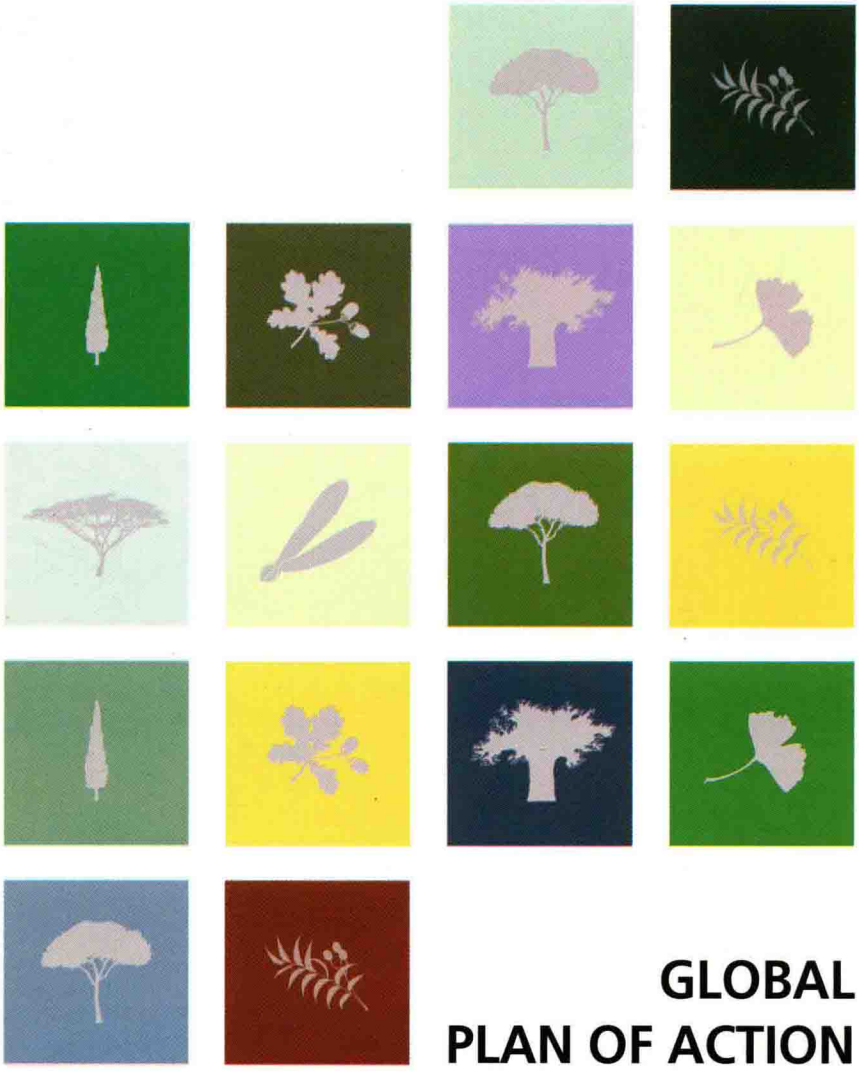

GLOBAL PLAN OF ACTION

FOR THE CONSERVATION, SUSTAINABLE USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES

COMMISSION ON
GENETIC RESOURCES
FOR FOOD AND
AGRICULTURE

CONTENTS

Foreword

Forest genetic resources (FGR) are the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value. They are crucial to the adaptation and protection of our ecosystems, landscapes and production systems, yet are subject to increasing pressures and unsustainable use.

At its 11th session in June 2007, the Commission on Genetic Resources for Food and Agriculture emphasized the urgent need to conserve and sustainably use FGR, and included a report on *The State of the World's Forest Genetic Resources* in its Multi-Year Programme of Work.

On the basis of the information and knowledge compiled by FAO for *The State of World's Forest Genetic Resources*, the Commission developed the *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources*, adopted by the FAO Conference at its 38th session in June 2013. This *Global Plan of Action* identifies 27 strategic priorities grouped into 4 areas: 1) improving the availability of, 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.

Implementation of the *Global Plan of Action* will strengthen the sustainability of the management of FGR while contributing towards the Millennium Development Goals, the post-2015 agenda and the Aichi Biodiversity Targets. While primary responsibility for implementation lies with governments, FAO has a strong commitment to supporting countries in these efforts, working with governments and other partners at the national, regional and international levels and in line with FAO's reviewed Strategic Framework approved by its Member States. Indeed, the *Global Plan of Action* is an integral part of FAO's efforts to realize its Strategic Objective 2 to "increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner".

I call upon all countries to seize the opportunities provided by this global framework to strengthen the conservation and sustainable management of FGR and unlock its potential for the benefit of present and future generations.

José Graziano da Silva
FAO Director-General

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Part I
INTRODUCTION

1. Forest covers about 31 percent of the world's total land area; 93 percent of this is 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's 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 forests and forest products for their food security and 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 nutrition and health needs and for income.

2. The contribution of forests and trees to meeting the present and future challenges of food security, poverty alleviation and sustainable development depends on the availability of rich diversity between and within tree species. Genetic diversity is needed in order to ensure that forest trees can survive, adapt and evolve under changing environmental conditions. It also maintains the vitality of forests and provides resilience to stresses such as pests 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, prospects for sustainable development in rural areas will be greatly influenced by the state of diversity in forest ecosystems and species.

3. Efforts to sustainably manage forest genetic resources (FGR) at international as well as at national levels need to draw on solid and coherent baseline information. The country reports submitted during the preparation of *The State of the World's Forest Genetic Resources*, which were developed based on FAO guidelines, are the main source of comparable information on FGR and their management and have served as the basis for the identification of priority areas for action on FGR.

4. Conserving FGR is vital, as they are 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 in the management of the genetic resources of forest trees.

5. FAO's activities on FGR are an integral part of the FAO Forestry Programme and contribute to other programme components such as the 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).

Nature of the Global Plan of Action

6. The Global Plan of Action is voluntary and non-binding and should not be interpreted or implemented in contradiction with existing national legislation and international agreements where applicable.

7. The Global Plan of Action constitutes a rolling document that can be updated in line with any follow-up that the Commission on Genetic Resources for Food and Agriculture may decide upon.

8. The relative priority of each strategic priority and associated actions may differ significantly in different countries and regions. Relative priority may depend on the genetic resources themselves, the natural environment or production systems involved, current management capacities, financial resources or policies already underway for the management of FGR.

Rationale for the Global Plan of Action

Key features of forest genetic resources

9. Most forest tree species are wild, managed in natural ecosystems, or are at a very primitive stage of selection or domestication compared to agricultural crops.[1]

10. Forest tree species are typically long-lived, highly heterozygous organisms that have developed natural mechanisms to maintain high levels of intraspecific variation, such as high rates of out-crossing, and dispersal of pollen and seeds over 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 organisms on earth.[2] *In situ* conservation allowing dynamic maintenance of genetic diversity and processes is the preferred approach for forest species, while *ex situ* conservation is most commonly used for domesticated plant species.

11. Forest species have multiple functions in that they provide numerous products and services. About 80 percent of people in the developing world use non-timber forest products for nutrition, health and income.

12. 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.

13. In terms of their present or potential contribution to food security and sustainable development, FGR are underutilized and undervalued.

14. Knowledge of FGR is usually scattered and held by various institutions in unpublished reports, meaning that in many countries access to it is limited. Baseline information, such as country species checklists, species distribution maps and forest reproductive material catalogues, are lacking.

15. 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 Global Plan of Action

16. The main aims of the Global Plan of Action are:

- to strengthen understanding and knowledge of FGR;

[1] National Academic Press. 1991. *Managing global genetic resources: forest trees*. Washington DC.

[2] FAO, FLD & IPGRI. 2004. *Forest genetic resources conservation and management. Vol 1: Overview, concepts and some systematic approaches*. Rome.

- 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 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 and in line with the international laws and regulations regarding intellectual property;
- 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.

17. The strategic priorities of the Global Plan of 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 of the Global Plan of 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 humans 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 distribution and ecosystem boundaries do not respect country borders. Strong partnerships and collaboration at various 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.

18. Resource mobilization to allow timely and adequate implementation of the Global Plan of Action requires due attention and effort at all levels, including coordination with the numerous initiatives underway within countries, regionally and globally (Convention on Biological Diversity [CBD], Global Environment Facility, etc).

Structure and organization of the Global Plan of Action

19. The strategic priorities of the Global Plan of Action are often closely related and interlinked. Many of the actions foreseen are relevant to more than one priority. They are grouped into four priority areas:

1. Improving the availability of, 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.

Part II
STRATEGIC PRIORITIES FOR ACTION

PRIORITY AREA 1
Improving the availability of, and access to, information on forest genetic resources

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. The availability of specific information on the status and trends in FGR is inadequate, although some progress has been made at national and subregional levels during the last decade.

The availability of, and access to, quality and up-to-date 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 checklist;
- 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, populations and genetic variation; and
- a lack of the knowledge of the reproductive and development characteristics of forests species that would allow for effective *ex situ* conservation, production of seedlings, planting and development of such species outside their original habitats.

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 indigenous and local communities in many developing countries, while also representing a tremendous asset for industrial and trade development in sectors such as pharmacy, food and 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

Improve the 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 increased demand for various forest products and services.

NATIONAL LEVEL

Strategic Priority 1

Establish and strengthen national FGR assessment, characterization and monitoring systems

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 surveys** 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 genebanks, information units and databases, and enhance information management and sharing at national and international levels.

Strategic Priority 2

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

As appropriate, develop guidance on registering, accessing, storing and using traditional knowledge of FGR at national, subnational and local scales, with effective participation of indigenous and local communities, taking into consideration similar initiatives under the CBD.

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 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 on FGR management policies.

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

Develop protocols for participatory assessment and monitoring of FGR.

Strategic Priority 4

Promote the establishment and the reinforcement of 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 from a lack of adequate financial support, especially in 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.

Promote the establishment and maintenance of FGR databases at local, subnational, national, regional and global levels.

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

PRIORITY AREA 2
In situ and *ex situ* conservation of forest genetic resources

The development of a worldwide conservation strategy for FGR is necessary in order 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 the distribution ranges of tree species. Regional collaboration through species or thematic networks should play an important role in implementing the conservation strategy and monitoring the progress made. This collaboration should aim to facilitate the use of the ecosystem approach and to promote greater awareness of the different types of forest and tree management (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
		Semi-natural		Plantations		
Primary	Modified natural	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 directly disturbed by humans	Forests of naturally regenerated native species where there are clearly visible indications of significant human activities	Silvicultural practices in natural forest by intensive management: • 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 growing pressure from the harvesting of forest resources and the conversion of forests to other land-use types. They mostly serve as refuges 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, even though most of them may have been primarily designed for purposes such as the protection of wildlife (mostly animals), recreation and various ecosystem services.