EUFORGEN

The implications of global, European and national policies

for the conservation and use of forest genetic resources in Europe

Pierre Bouillon, Jason Hubert, Kjersti Bakkebø Fjellstad, Mari Rusanen, Ani Zavrl Bogataj, Ditte C. Olrik, Sándor Bordács, Roman Longauer, Despina Paitaridou, Kadi Kõiv, Jarkko Koskela, Saša Orlovic, Sanna Black-Samuelsson and Frank Wolter

Bioversity International

Bioversity International is a global research-for-development organization. We have a vision – that agricultural biodiversity nourishes people and sustains the planet. We deliver scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security. We work with partners in low-income countries in different regions where agricultural and tree biodiversity can contribute to improved nutrition, resilience, productivity and climate change adaptation. Bioversity International is a member of the CGIAR Consortium – a global research partnership for a food-secure future.

European Forest Genetic Resources Programme (EUFORGEN) is an instrument of international cooperation promoting the conservation and appropriate use of forest genetic resources in Europe. It was established in 1994 to implement Strasbourg Resolution 2 adopted by the first Ministerial Conference of the FOREST EUROPE process, held in France in 1990. EUFORGEN also contributes to implementation of other FOREST EUROPE commitments on forest genetic resources and relevant decisions of the Convention on Biological Diversity (CBD). Furthermore, EUFORGEN contributes to the implementation of regional-level strategic priorities of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (GPA-FGR), adopted by the FAO Conference in 2013. The Programme brings together experts from its member countries to exchange information and experiences, analyse relevant policies and practices, and develop science-based strategies, tools and methods for better management of forest genetic resources. Furthermore, EUFORGEN provides inputs, as needed, to European and global assessments and serves as a platform for developing and implementing European projects. EUFORGEN is funded by the member countries and its activities are mainly carried out through working groups and workshops. The EUFORGEN Steering Committee is composed of National Coordinators nominated by the member countries. The EUFORGEN Secretariat is hosted by Bioversity International. Further information on EUFORGEN can be found at www.euforgen.org.

Citation: Bouillon, P., Hubert, J., Bakkebø Fjellstad, K., Rusanen, M., Zavrl Bogataj, A., Olrik, D.C., Bordács, S., Longauer, R., Paitaridou, D., Kõiv, K., Koskela, J., Orlovic, S., Black-Samuelsson, S. and Wolter, F.. 2015. The implications of global, European and national policies for the conservation and use of forest genetic resources in Europe. European Forest Genetic Resources Programme (EUFORGEN), Bioversity International, Rome, Italy. xii and 42 p.

Cover photos: FOREST EUROPE (left) and Michele Bozzano (right)
Layout: Ewa Hermanowicz

ISBN 978-92-9255-033-2

Bioversity International
Via dei Tre Denari, 472/a
00057 Maccarese
Rome, Italy

AUTHORS

Pierre Bouillon
Ministère de l'agriculture,
de l'agroalimentaire et de la forêt, Paris
France

Jason Hubert
Forestry Commission Scotland, Edinburgh
United Kingdom

Kjersti Bakkebø Fjellstad
Norwegian Genetic Resource Centre,
Norwegian Institute of Bioeconomy
Research, Ås
Norway

Mari Rusanen
Natural Resources Institute (Luke), Vantaa
Finland

Ani Zavrl Bogataj
Inspectorate for Agriculture, Forestry, Game
and Fishery, Ljubljana
Slovenia

Ditte Christina Olrik
Danish Ministry of the Environment,
Græsted
Denmark

Sándor Bordács
National Food Chain Safety Office
Directorate of Plant Production and
Horticulture, Budapest
Hungary

Roman Longauer
National Forest Centre, Zvolen
Slovakia

Despina Paitaridou
Directorate General for the Development
and Protection of Forest and Natural
Environment, Athens
Greece

Kadi Kõiv
Forest Department
Ministry of the Environment, Tallinn
Estonia

Jarkko Koskela
Bioversity International, Rome
Italy

Saša Orlovic
Institute of Lowland Forestry and
Environment, Novi Sad
Serbia

Sanna Black-Samuelsson
Swedish Forest Agency
Uppsala
Sweden

Frank Wolter
Administration de la nature et des forêts
Diekirch
Luxembourg

PREFACE

During the past two decades, a plethora of policy instruments have been created at global, European and national levels to support the implementation of sustainable forest management. Furthermore, additional policies developed by other sectors (e.g. agriculture, biodiversity and energy) have also addressed many forest-related issues. All these policy instruments have had both direct and indirect implications for the forest sector: mostly predicted and planned ones, but in some cases also unpredicted or even unwanted ones. Within the forest sector, the conservation and use of forest genetic resources is one of the topics that have remained at the cross-roads of many global, European and national policies. This means that various policies often influence the conservation and use of forest genetic resources in one way or another, even if the policies themselves do not specifically target forests or genetic resources. Issues related to genetic resources also offer an illustrative example of a situation in which the forest sector has often found itself: reacting and adapting to policies developed by other sectors.

Within the framework of the European Forest Genetic Resources Programme (EUFORGEN), the implications of global, European and national policies for the conservation and use of forest genetic resources have been increasingly discussed during the past 10 years or so. EUFORGEN was established in 1994 to coordinate pan-European collaboration on forest genetic resources as part of the FOREST EUROPE process (earlier the Ministerial Conference on the Protection of Forests in Europe – MCPFE). During Phase IV (2010–2014), EUFORGEN had three objectives: (1) promote appropriate use of forest genetic resources as part of sustainable forest management to facilitate adaptation of forests and forest management to climate change; (2) develop and promote pan-European genetic conservation strategies and improve guidelines for management of genetic conservation units and protected areas; and (3) collate, maintain and disseminate reliable information on forest genetic resources in Europe. EUFORGEN has brought together scientists, managers and policy-makers to discuss various issues related to forest genetic resources and to develop pan-European approaches for better management of these resources.

The present document reports findings and recommendations of the EUFORGEN working group on policies related to forest genetic resources. The report identifies the most relevant global, European and national policies that have direct or indirect implications for the conservation and use of forest genetic resources, and provides recommendations for countries and for further EUFORGEN work in this area. The working group held two meetings at Bioversity International in Maccarese, Italy, on

10–12 September 2013 and 20–22 January 2014. The Working Group provided an update to the EUFORGEN Steering Committee during its 9th meeting, held in Tallinn, Estonia, 3–5 December 2013. The draft report was then presented to the 10th meeting of the EUFORGEN Steering Committee, held in Edinburgh, United Kingdom, 16–18 June 2014. The Steering Committee then reviewed the draft report for finalization and publication.

CONTENTS

Authors iii
Preface v
Acronyms used in the text ix
Executive summary xi
Introduction 1
Global agreements and commitments 7
Nagoya Protocol 8
Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources 11
European initiatives 15
FOREST EUROPE 15
Draft text for a legally binding agreement on forests in Europe 16
EU Forest Strategy 18
Rural Development Programme 19
EC Directive on Plant Reproductive Material 22
EU Regulation on invasive alien species 22
Revision of Council Directive 2000/29/EC on organisms harmful to plants 25
Sub-regional policies 29
Forest genetic resources within Nordic cooperation 29
National-level implementation of relevant policies and commitments 31
Options for incorporating forest genetic resources into National Forest Programmes and other relevant national policies and strategies 35
Conclusions and recommendations 37
References 39
Annex 1 41

ACRONYMS USED IN THE TEXT

ABS	Access and Benefit Sharing
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
COP	Conference of the Parties [to the CBD]
EAFRD	European Agricultural Fund for Rural Development
EUFGIS	European Information System on Forest Genetic Resources
EUFORGEN	European Forest Genetic Resources Programme
FAO	Food and Agriculture Organization of the United Nations
FGR	forest genetic resources
FRM	forest reproductive material
GPA-FGR	Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources
IAS	invasive alien species
INC	Intergovernmental Negotiating Committee
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUFRO	International Union of Forest Research Organizations
LBA	legally binding agreement
MTA	material transfer agreement
NFP	national forest programme
NGO	non-governmental organization
NordGen	Nordic Genetic Resource Centre
R&D	research and development
RDP	Rural Development Programme
SoW-FGR	State of the World's Forest Genetic Resources
SP	Strategic Priority
UKFS	UK Forestry Standard
UNCED	United Nations Conference on Environment and Development
UNFF	United Nations Forum on Forests

EXECUTIVE SUMMARY

The past two decades have seen the adoption of many policy instruments designed to foster sustainable forest management, in addition to several more that have an impact on the forestry sector. These policies often have consequences for the conservation of forest genetic resources (FGR) even if they do not directly address the topic. Indeed, one over-arching concern is that although many policies have an impact on the conservation and use of FGR, they often do not spell that out directly. Instead, FGR are supposed to be subsumed in the wording "biological diversity", implying that all levels (ecosystems as well as interspecific and intraspecific diversity) are included by default. However, most of the time, biological diversity only refers to ecosystems. To face this background and challenge, a EUFORGEN working group was asked to study the most relevant policies at national, regional and international levels to gain a better understanding on the impacts of policies on the conservation and use of FGR.

Given the importance of forests in people's lives and in the economic sector, and the ways in which policies concerned with agriculture, energy, climate, trade and environment affect forestry, the working group cautions that too often policies in these sectors are formulated without the benefit of forestry expertise. A challenge for the forestry sector at this time of rapid change is to follow and influence these policies without necessarily having a seat at the table. By the same token, policy-makers may not be sufficiently aware that international agreements, such as the Convention on Biological Diversity, create legally-binding commitments to be implemented through national strategies and programmes. Forestry professionals need to raise awareness of these obligations and contribute to their implementation.

The working group welcomes the release of the *State of the World's Forest Genetic Resources* (SoW-FGR) report by FAO in 2014. The findings of the report provide a useful baseline and have already been used to develop the Global Plan of Action on Forest Genetic Resources (GPA-FGR), adopted by the FAO Conference in 2013. The working group urges all European countries to contribute to the implementation of the GPA-FGR.

Policy background

During the first Ministerial Conference on the Protection of Forests in Europe (MCPFE) in Strasbourg in 1990, participating countries decided to implement national policies for the conservation of forest genetic resources (Resolution S2). Since then the MCPFE (now FOREST EUROPE) has served as a high-level forum for the discussion on forest policy and has had a significant role in promoting the implementation of sustainable forest management in Europe. Internationally, the 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro, resulted in two important documents: *Forest Principles*, a non-binding agreement by countries to commit to the conservation, management and sustainable development of all kinds of forest, and the Convention on Biological Diversity (CBD), a legally-binding agreement for the conservation of all levels of biological diversity. The Rio conference also adopted the UN Framework Convention on Climate Change (UNFCCC) and the UN Convention to Combat Desertification (UNCCD). Neither of these international conventions focuses on forests but they have nevertheless promoted sustainable forest management around the world. More recently, the Nagoya Protocol, which regulates access to genetic resources, and related benefit sharing when these resources are utilized for research and development, is likely to make international and collaborative research on FGR more difficult.

After the Rio conference, several European countries began to develop national policies on forestry as well as national forestry programmes. Many other policy documents have also had a direct or indirect impact on forestry; unfortunately these seldom recognise the importance of FGR or link with ongoing national work on FGR to these policies.

The report examines in more detail policies that influence the conservation and use of FGR in Europe, including the EU Forest Strategy, which was approved in 2014 for the period to 2020. EU policies on invasive alien species and on the protection of plant health may also have some bearing on FGR, mostly by minimising the risk of threats to forest species.

For individual countries, the working group considered that the predominance and participatory nature of the national forest programme makes these programmes an "excellent tool" for incorporating FGR into forest policies The report offers some options for incorporating FGR into national forest programmes and other policies and strategies.

INTRODUCTION

Since the 1990s, several global and European policy initiatives have been launched to promote the conservation and sustainable management of forests and their biological diversity. In 1990, European countries initiated a pan-European forest policy process as a response to concerns on the impacts of environmental pollution and forest degradation in Europe. This process, now called FOREST EUROPE (earlier the Ministerial Conference on the Protection of Forests in Europe – MCPFE) has served well as a high-level forum for addressing forest policy issues and it has also contributed significantly to the implementation of sustainable forest management in Europe (Mayer and Buck, 2005). In 1992, the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, adopted two documents that have been highly relevant for global efforts to improve the management of forests. The first document was a non-legally binding statement called 'Forest Principles' in which countries affirmed their commitment for conservation, management and sustainable development of all types of forests. The second document was a legally binding agreement for the conservation of all levels of biological diversity, i.e. the management of forests. As a result of the UNFF work, the UN General Assembly adopted a Non-Legally Binding Instrument on All Types of Forests in 2007. The Rio Conference in 1992 also adopted two other international agreements, namely the UN Framework Convention on Climate Change (UNFCCC) and the UN Convention to Combat Desertification (UNCCD). These conventions did not focus on forests but they have played a major role in promoting the implementation of sustainable forest management around the world.

The conservation and appropriate use of forest genetic resources (i.e. genetic material of forest trees that is of actual or potential use for humans), is a crucial element of sustainable forest management. Furthermore, genetic diversity ensures that forest trees can survive, adapt and evolve under changing environmental conditions. Genetic diversity is also needed to maintain the vitality of forests and to cope with pests and diseases. However, of all the above-mentioned policy-initiatives, only FOREST EUROPE and the CBD have specifically addressed forest genetic resources (FGR) and recognized their important role.

In 2010, a key change took place, when FAO decided to launch the global process of the first ever *State of the World's*

Forest Genetic Resources. The first world report comprised 86 country reports, covering 85% of the world forest surface, and was published in 2014 (FAO, 2014). A global and non-legally binding instrument specifically on FGR was then also adopted by FAO Conference in 2013, namely the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (GPA-FGR). This FAO impetus was a major step in building the basis of a perennial and practical world policy on FGR.

Initially the process covered the European continent, with the first Ministerial Conference of the FOREST EUROPE process held in Strasbourg, France, in 1990. It adopted a resolution on the conservation of forest genetic resources in Europe (Strasbourg Resolution 2). As part of this resolution, ministers responsible for forests also called for "a functional but voluntary instrument of international cooperation" to be established to promote and coordinate (1) *in situ* and *ex situ* conservation of genetic diversity of European forests; (2) exchange of reproductive materials; and (3) monitor progress in these fields. In 1993, the second Ministerial Conference, held in Helsinki, Finland, clarified the elements of sustainable forest management and also endorsed the establishment of the European Forest Genetic Resources Programme – EUFORGEN – to facilitate the implementation of Strasbourg Resolution 2. Since then, European countries have confirmed their specific commitment to the conservation of FGR in several other FOREST EUROPE resolutions and declarations promoting sustainable forest management (e.g. Vienna Resolution 4, in 2003, and the Warsaw Declaration in 2007).

Under the CBD, the discussions on forest biological diversity started in 1995. Later, in 2000, the topic was identified as one of the thematic areas to be addressed within the Convention. In 2002, the CBD adopted its Expanded Work Programme on Forest Biological Diversity, which called for development of information systems and strategies on forest genetic resources, implementation of these strategies and sustainable use of forest genetic diversity, and promotion of fair and equitable sharing of benefits resulting from the utilization of forest genetic resources. The new GPA-FGR approved by FAO in 2013 is designed to support the implementation of relevant CBD commitments, by identifying strategic priorities at the national, regional and global levels for strengthening the conservation and use of genetic resources as part of sustainable forest management.

After the Strasbourg and Rio Conferences, many European countries started to develop specific national programmes or strategies for managing their forest genetic resources (e.g. Graudal, Kjaer and Canger, 1995; Teissier du Cros, 2001) or to strengthen the efforts they had already started in the 1980s (e.g. Behm *et*

al., 1997). However, the implementation of these national programmes and strategies has been hindered by political problems, such as complexities of national legal and administrative structures that have made practical conservation work difficult (Geburek and Konrad, 2008). Furthermore, development of other forest-related national policies and their implementation, such as national forest programmes (NFPs), rarely recognized the importance of FGR, nor attempted to create synergies with the ongoing national work on FGR. In 2010, a total of 37 European countries had NFP or its equivalent, which are a participatory process of policy planning, implementation, monitoring and evaluation of sustainable forest management (FOREST EUROPE/UNECE/FAO, 2011). In addition, European countries, as well as the European Union, have developed in recent years, or are currently developing, various policies or strategies that do not specifically target forests but which often have direct or indirect implications for the forest sector, including the conservation and use of FGR.

National and regional adaptation strategies to climate change were one of the topics discussed during a FOREST EUROPE workshop organized by EUFORGEN and the International Union of Forest Research Organizations (IUFRO) in 2006 (see Koskela, Buck and Teissier du Cros, 2007). The workshop noted that the impacts of climate change on forests will vary in different parts of Europe, bringing both opportunities and threats. The workshop participants also stressed the fact that FGR play a key role in maintaining the resilience of forests to threats, and in taking advantages of the opportunities. One of the workshop recommendations urged European policy-makers to recognize the importance of forest genetic diversity in mitigating the impacts of climate change on the forest sector, by expressing a commitment at pan-European level to incorporate the management of this diversity into NFPs and other relevant policies, programmes and strategies (e.g. national adaptation strategies to climate change, and national action plans for biodiversity conservation).

Between 2005 and 2009, the EUFORGEN Forest Management Network discussed several policy issues related to the use of forest genetic resources in particular. Experts participating in this network conducted two surveys in 2006–2007, one on tools and mechanisms to promote the use of high-quality forest reproductive material (FRM) and another one on policies and practices related to genetic resources and forest management. The first survey found that 11 of the 17 countries that provided feedback had specific requirements or regulations for promoting the use of high-quality FRM in state forests, and that 8 countries had created specific provenance requirements as part of grant schemes supporting tree planting. The second survey received feedback from 21 countries and 16 of

them reported having a formal NFP in place. Genetic resources are addressed in 13 NFPs, but often in rather a general way. Only in two countries (France and Germany), did the NFPs include more detailed description as to how genetic resources were incorporated into national forest policy and its implementation. National adaptation strategies to climate change were in place in 14 countries, but in 6 countries genetic resources were only mentioned in a general way.

During recent years, the EUFORGEN Steering Committee, consisting of representatives from all member countries, has also followed and discussed a number of international and European policy initiatives. Access to genetic resources and the fair and equitable sharing of the benefits arising from their use ("Access and Benefit Sharing" – ABS) has been one of the three objectives of the CBD since 1992, but it took until 2010 before an international ABS agreement (i.e. the Nagoya Protocol) was adopted as part of the CBD. In 2010, just weeks before the adoption of the Nagoya Protocol, the Steering Committee discussed preliminary findings of a NordGen project on ABS-related topics (see Tvedt, 2011) and recommended that EUFORGEN should closely follow the international negotiation process on ABS as it has potentially strong implications for the exchange and use of FGR for research and development (R&D) in Europe. In 2012, the Steering Committee also discussed the draft text for a legally binding agreement on forests in Europe, developed by the Intergovernmental Negotiating Committee (INC) as a follow-up to the Oslo Conference of the FOREST EUROPE process. The Steering Committee considered that this draft agreement on European forests should make a specific reference to the conservation of FGR in its biodiversity-related paragraphs, and noted that the agreement should also promote appropriate use of genetic resources as part of sustainable forest management. Subsequently, the Steering Committee developed a wording proposal for the third session of the INC, held in 2013. Furthermore, the Steering Committee has also discussed and exchanged views on the development of the new EU Forest Strategy, the new EC Regulation for rural development and the new EC Regulation on plant reproductive material, which all have a number of direct implications for the conservation or use, or both, of FGR in Europe.

In 2012, the EUFORGEN Steering Committee decided to establish a working group to review policies related to FGR as a follow-up to the earlier policy-related work. The main tasks of the working group were to explore ways to promote incorporation of the conservation and use of FGR into NFPs and other relevant policies and strategies, and to make recommendations for further action at the pan-European level. More specifically, the Steering Committee requested the working group to:

- Review relevant outputs of the previous Forest Management Network.
- Examine the impact of the Nagoya Protocol and the possible sector-specific approach of ABS on relevant policies (at national or European level).
- Prepare advice (possible options and actions for awareness raising) on FGR for policy-makers responsible for revision or development of NFPs.
- Analyse possible implication of legally binding agreements (LBAs) on NFPs referring to FGR.
- Analyse the options to incorporate FGR into any relevant European or national policy documents.
- Review and identify policies and agreements relevant to FGR.

The following chapters of this report present in detail the findings and recommendations of the working group.

GLOBAL AGREEMENTS AND COMMITMENTS

Convention on Biological Diversity

The Convention on Biological Diversity (CBD) entered into force on 29 December 1993 and currently (August 2015) it has 196 Parties. The CBD is thus one of the international agreements that have been ratified by nearly all countries of the world. The CBD has three main objectives: (1) the conservation of biological diversity; (2) the sustainable use of the components of biological diversity; and (3) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The CBD recognizes that countries have sovereign rights over their own biological resources and assigns them the responsibility for conserving biological diversity. It also urges countries to use the biological resources in a sustainable manner and highlights specifically the importance of genetic resources. Countries are also urged to enhance technical and scientific cooperation, training and information exchange on the conservation and sustainable use of biological diversity.

The CBD carries out its work through seven thematic programmes (of which one is on forest biodiversity) and by addressing a total of 20 cross-cutting issues. Although one of the CBD objectives focuses specifically on genetic resources, a large part of the CBD work during the past 20 years has targeted issues related to biological diversity at the species and landscape levels. A review by Laikre *et al*. (2010) found that numerous actions have been carried out at national and global levels to implement the CBD commitments, but these have largely neglected genetic diversity. However, during recent years, i.e. since the negotiation and adoption of the Nagoya Protocol (discussed below), genetic resources have received more attention as part of the CBD work. Consequently, it is likely that the CBD will continue to expand its focus on genetic resources in the future.

Over the years, the Conferences of the Parties (COP) to the CBD have made several decisions and recommendations on forest biological diversity and some of them specifically address forest genetic diversity. COP-6 adopted the Expanded Programme of Work on Forest Biological Diversity in 2002. Under Goal 1.4 (*To promote the sustainable use of forest biological diversity)*, the Programme of Work encourages development of information systems and strategies for *in situ* and *ex situ* conservation and sustainable use of forest genetic diversity (Objective 1.4.4). In 2008, COP-9 urged Parties to "*promote and implement sustainable forest*

management and the ecosystem approach to maintain forest biodiversity and ecosystem functions, in all types of forests, promote forest restoration and minimise deforestation and forest degradation so as to achieve the goals and objectives of the programme of work including addressing climate change" (Decision IX/5). Furthermore, COP-9 invited Parties, other governments and international organizations to "*recognize and increase understanding of the potential of forest genetic diversity to address climate change, maintain forest ecosystems resilience and lead to the discovery of new timber and non-timber forest resources*".

In 2010, COP-10 adopted a Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets (https://www.cbd.int/sp/targets/), for the period 2011–2020 (Decision X/2). This Strategic Plan aims "*to improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity*" (Strategic Goal C). Strategies for the conservation of cultivated plants and domesticated animals, as well as their wild relatives (including other socio-economically and culturally valuable species, such as forest trees) are expected to be developed and implemented by 2020 (see Target 13).

Nagoya Protocol

In 2010, COP-10 adopted a legally binding agreement called the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization. This agreement entered into force on 12 October 2014. The aim of the Nagoya Protocol is to ensure that accessing and utilizing genetic resources is undertaken in a legal way and with the prior agreement of the holders of the genetic material. The access and mutually agreed terms (MAT) of sharing the benefits from the use of the genetic material should also be agreed by both parties (the owners and the users) prior to any form of exploitation. The Nagoya Protocol makes it obligatory for the Parties to implement appropriate legislative, administrative or policy measures, and set up operational administrative structures and procedures for providing access to genetic resources and for agreeing the terms of sharing the benefits.

The Nagoya Protocol is broad in its scope and covers all forms of genetic material (i.e. plants, animals and microorganisms) plus any biochemical derivatives that are produced by that material. Trees are therefore also included in the scope of the protocol, but during the negotiation process, it was not possible to take into consideration any specific characters of forest trees, nor consider any specific arrangements for the forest sector. The term "utilization of genetic resources" is defined rather narrowly in the Nagoya Protocol, meaning "to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology" (CBD, 2011). Therefore, the protocol

does not impose any ABS arrangements for the use of genetic resources for production purposes, such as buying seeds and growing seedlings for forestry purposes. The Nagoya Protocol will have implications for provenance research and forest tree breeding, but these are difficult to analyse at this stage as many countries are still in the process of establishing national ABS regulatory systems. However, the Nagoya Protocol is expected to increase transaction costs and administrative work, and complicate the utilization and transfer of tree germplasm for R&D in the forest sector (e.g. Koskela *et al*., 2014).

The European Union (EU), a Party to the CBD, has adopted the Nagoya Protocol and, in October 2012, the European Commission presented a proposal for an ABS regulation to implement the mandatory elements of the Nagoya Protocol for the EU. In April 2014, the European Parliament and the Council adopted a Regulation ((EU) No 511/2014) on ABS that establishes minimum rules governing compliance for genetic resources in accordance with the Nagoya Protocol. The regulation entered into force on 9 June 2014 and it applies from the date when the Nagoya Protocol itself entered into force (12 October 2014). This regulation recognizes that the Member States exercise sovereign rights over genetic resources within their jurisdiction, but that the transfer of genetic resources (or traditional knowledge associated with genetic resources held by indigenous or local communities) needs to be governed by a common set of rules. Ideally the mechanism for ensuring fair and equitable sharing of benefits and assurance of legal possession is through an internationally recognized certificate of compliance. If one is not available, then additional information and documentation is needed to comply with the regulation. This documentation (or a certificate) must be retained for 20 years after the end of the period of utilization. For the establishment of new provenance trials, this means additional administrative work and a very lengthy process of gathering and maintaining the necessary documentation and agreements concerning access to and utilization of FGR.

For agricultural crops, which are listed in Annex I of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), there is already a multilateral procedure in place for dealing with ABS that is compatible with the Nagoya Protocol. Therefore, the standard material transfer agreement (MTA) developed for the ITPGRFA will be recognized within the EU as an acceptable certificate of compliance, and it is likely that this agreement will also become the standard agreement within the EU for non-Annex 1 species. Hopefully this will reduce bureaucracy for those Member States that have already signed the ITPGRFA. However, the EC is planning to create a central, web-based register, and each Member State

will be obliged to provide information to this register. Furthermore, the EU has proposed that all recipients of research funding involved in the utilization of genetic resources will have to demonstrate due diligence with respect to their obligations under the Nagoya Protocol and the EU regulation.

The implementation of the Nagoya Protocol is likely to bring the following opportunities and benefits to EUFORGEN and its members:

- As part of the regulation, the EU realizes that more effort will be required to promote and encourage awareness of the Nagoya Protocol and its implementation. This would also be an opportunity to raise awareness about FGR in general, and more funding may become available to support this work.
- There is potentially a technical role for EUFORGEN to play in assisting European countries and the EU to implement the Nagoya Protocol, and in gathering related experiences and lessons learned from different countries.
- The regulation will require concrete documentation that should be effected by several national organizations. This is an important factor, especially for long-term trials, as details of provenances or origins can be lost by the trial manager over time. The increased importance of clearly documented material will also help to reduce the chance of poorly referenced material being used in new trials.
- The use of a single, common MTA will increase legal clarity between providers and users when FGR is transferred for R&D.

Furthermore, the EUFORGEN community could play a role in further discussions on best practices to support the implementation of the Nagoya Protocol in Europe, and on possible sector-specific ABS arrangements.

Some challenges for users of FGR for R&D are considered below.

There is no doubt that more time will be required to fill in forms and to ensure that the agreements are signed and archived. Any future projects involving international field trials will have to factor-in this element in their work plans.

Until the national ABS regulatory systems are in operation there will be uncertainty as to how each country will respond, and whether they will use the ITPGRFA material transfer agreement or develop a national template.

The requirement for the users of FGR to maintain records for 20 years after the end of the period of utilization could be very onerous for forestry experiments.

Forest time is longer than in other sectors, and that applies also to R&D on FGR. During long-term provenance

trials, there is an increasing likelihood that organizations listed in the original MTA will cease to exist or that persons involved in the establishment of the trials will retire or die. It is not clear in any of the regulations or MTAs how the obligations are passed to successors or possible new organizations.

Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources

In June 2013, FAO Conference adopted the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (GPA-FGR). The GPA-FGR was developed in parallel to the finalization of the first ever State of the World's Forest Genetic Resources (SoW-FGR) report, and based on the information obtained from the country reports and eight regional consultations organized in 2012. The draft strategic priorities were reviewed by the second meeting of the FAO Intergovernmental Technical Working Group on FGR in January 2013. Subsequently, the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) reviewed and revised the draft strategic priorities in April 2013 and agreed on them as the GPA-FGR (summarized in Annex 1 to this report).

The GPA-FGR identifies strategic priorities for action for conservation, sustainable use and development of FGR at the international, regional and national levels. The strategic priorities are based on the assumption that countries have sovereign rights over their natural resources and that substantial international cooperation is necessary for effective management of FGR. The GPA-FGR is a non-binding document, but it is deeply connected to regular national reports on the state of FGR, monitored by means of specific indicators. Within the GPA-FGR, the relative priority of different strategic priorities varies across countries and regions.

In the GPA-FGR, a total of 27 Strategic Priorities (SPs) are grouped into four priority areas:

- improving the availability of, and access to, information on FGR;
- conservation of FGR (*in situ* and *ex situ*);
- sustainable use, development and management of FGR; and
- policies, institutions and capacity-building.

In addition, the priorities are classified at the international, regional and national levels, depending on at what level the proposed action should take place.

Generally, the priorities at international level are the responsibility of international organizations, such as FAO, but there may also be a role for regional efforts contributing to the global goals. Indeed, some of the priorities at the international level have already been im-

plemented at the regional level in Europe. EUFORGEN, for example, through the EU-funded European Information System on Forest Genetic Resources (EUFGIS) project (2007–2011), has developed pan-European minimum requirements for dynamic conservation units of forest trees. These minimum requirements contribute to SP-3 (development of international technical standards and protocols for FGR inventories, characterization and monitoring of trends and risks). Among international-level priorities, one priority focuses on development and promotion of networking and collaboration among concerned countries, to combat invasive species (animals, plants and microorganisms) affecting FGR. This priority is also clearly relevant for Europe, and even if it is not exactly in line with the EUFORGEN main targets and expertise, there should be consideration concerning what kind of role EUFORGEN could have in this activity.

The regional-level priorities are clearly interesting for Europe. The three regional-level priorities are to:

- develop and implement regional *in situ* conservation strategies and promote eco-regional networking and collaboration (SP-11);
- promote and apply mechanisms for germplasm exchange at regional level to support R&D activities, in agreement with international conventions (SP-23); and
- reinforce regional and international cooperation to support education, knowledge dissemination, research and conservation and sustainable management of FGR (SP-24).

The development of regional *in situ* conservation strategies (SP-11) has been a key activity for EUFORGEN since the establishment of the Programme. The work continues and the implementation of the conservation strategies has to be kept in the agenda, but by now the regional collaboration is so well established that the strategy development element is no longer the first priority for Europe. Concerning germplasm exchange (SP-23), various structures in Europe are promoting all types of germplasm exchange for R&D, and in various cases EUFORGEN has provided, and can still provide, valuable background support. The implementation process of the Nagoya Protocol on ABS, as described earlier, needs to be carefully followed by the forest sector. In relation to this, EUFORGEN may have an important role as a facilitator in transferring germplasm for the establishment of new international provenance trials and testing future forest adaptation policies with respect to climate change. The reinforcement of regional and international cooperation (SP-24) has been one of the main activities of EUFORGEN throughout its existence, especially in the fields of conservation, sustainable forest management and knowledge dissemination.

The importance of the national-level strategic priorities differs among European countries. The priorities connected to indigenous peoples and their traditional knowledge (SP-2, SP-22), for example, are important, but valid only for a few European countries and therefore they do not need to be considered as a EUFORGEN priority. The need for wider education on FGR has been recognized in many European countries (SP-21) but the specific demands vary among countries. It also has to be remembered that, at global level, this priority is targeted at developing countries rather than Europe.

The priority to establish and strengthen national FGR assessment, characterization and monitoring systems (SP-1) has already been identified as an important action at the European level and preliminary work on developing genetic monitoring methods has been started by EUFORGEN. A working group on genetic monitoring has written an extensive analysis on possible approaches (Aravanopoulos *et al.*, 2015). Within the EUFORGEN community, there is strong interest in developing a genetic monitoring scheme, but a key obstacle seems to be finding financial resources for the implementation of such a long-term monitoring activity. However, it has been stressed that, even without any long-term funding scheme, it is extremely important to start collecting base-line data that can be used in the future as a reference to evaluate the effect of climate change on genetic resources.

Among the priorities on *in situ* and *ex situ* conservation at the national level, the one on the management of marginal populations (SP-7) is relevant to both northern and southern European countries, and especially important to the Mediterranean countries in the context of climate change. The priority on supporting climate change adaptation and mitigation through proper management and use of FGR (SP-14) is clearly important for the whole European forest sector. EUFORGEN is also following the developments in preparation of the EU Adaptation Strategy to Climate Change, and may help countries to pay proper attention to the role of FGR in their national adaptation strategies (see Chapter 3). The Strategic Priority on developing national strategies for *in situ* and *ex situ* conservation and sustainable use (SP-18) has also been in the agenda since the beginning of EUFORGEN. Most European countries have already developed national FGR strategies and a more urgent task is updating these strategies, as well as identifying conservation and management needs, and integrating them into wider policies (SP-19), as will be discussed further in Chapter 5.

France offers an example of the national implementation of the GPA-FGR. The country has decided to add into its 2014 new forest law the following aspects:

- recognition of the conservation of FGR as a priority policy of public interest ; and
- integration of a specific chapter on FGR that includes four components of the national forest policy on FGR (i.e. inventory; conservation; selection; and use (including trade of FRM and R&D) in compliance with the Nagoya Protocol.

After the law was published in October 2014, the French Ministry of Agriculture, Food and Forestry was mandated, through legislative and regulatory authority, to take the following actions on FGR:

- Inventory: regularly update the national report for FAO's SoW-FGR report and the national list of forest tree species (currently about 2 700 tree species, including the French overseas territories).
- Conservation: regular approval of *in situ* and *ex situ* conservation units of national interest.
- Selection: approval of basic material in the national register of forest species according to EC Directive 99/105.
- Use: regulate the trade in FRM, and develop national recommendations on a species basis for the sustainable use of FRM (including adaptation of FGR to climate change) and rules to comply with the Nagoya Protocol when using FGR for R&D.

In December 2013, during its 9th meeting, held in Tallinn, Estonia, the EUFORGEN Steering Committee discussed the GPA-FGR and its strategic priorities. The Steering Committee decided that EUFORGEN will contribute to the implementation of the GPA-FGR, and especially its regional-level priorities, in Europe.

EUROPEAN INITIATIVES

FOREST EUROPE

FOREST EUROPE (earlier the Ministerial Conference on the Protection of Forests in Europe – MCPFE) is the pan-European high-level political process for forests and forestry. Since 1990, FOREST EUROPE has promoted protection and sustainable management of forests in its forty-six member countries and the European Union. The work has resulted in recommendations, guidelines, and criteria and indicators for sustainable forest management. FOREST EUROPE contributed significantly to the implementation of sustainable forest management and has defined the concept as

> "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems".

Since 1990, the FOREST EUROPE process has convened seven ministerial conferences. The FOREST EUROPE expert level meetings are the decision-making meetings between the ministerial conferences, attended by representatives of member countries as well as by observers. FOREST EUROPE representatives and nominated experts attend working groups, seminars, workshops and other meetings on specific subjects of a scientific, technical or political nature. Bioversity International is one of the observer organizations to FOREST EUROPE.

FGR were high in the agenda of the first FOREST EUROPE ministerial conference, which adopted Strasbourg Resolution S2 (Conservation of forest genetic resources). Other subsequent ministerial conferences have also addressed the importance of FGR. Vienna Resolution V4 (Conserving and enhancing forest biological diversity in Europe, 2003) urged European countries to "promote the conservation of forest genetic resources as an integral part of sustainable forest management and continue the pan-European collaboration in this area", re-affirming the importance of the work that had been started at the national and pan-European levels after the Strasbourg Conference.

The role of EUFORGEN as functional instrument of international cooperation was recognised by the seventh FOREST EUROPE ministerial conference in 2015 with the Resolution Madrid M2 (Protection of forests in a changing environment) where representatives of the Signatories of FOREST EUROPE committed to:

> "Continue pan-European collaboration on forest genetic resources through the European Forest Genetic Resources Programme (EUFORGEN)".

The same Resolution M2 also encouraged countries to: "Promote national implementation of strategies and guidelines for dynamic conservation and appropriate use of forest genetic resources under changing climate conditions" which is an important recognition of the work of the EUFORGEN programme in the past decade.

The pan-European set of criteria and indicators for sustainable forest management also include an indicator on genetic resources. Under the heading "Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems", Indicator 4.6 focuses on "Area managed for conservation and utilization of forest tree genetic resources (*in situ* and *ex situ* gene conservation) and area managed for seed production". Data on the indicators are collected by EUFORGEN from the various countries and submitted for the preparation of the *State of Europe's Forests* reports, which provide a comprehensive description of status of and trends in forests and forest management in Europe. A total of 38 countries provided the 2015 data on this indicator (or part of it) to the EUFORGEN Secretariat. In 38 countries, 501,567 ha of forests were managed for *in situ* gene conservation in 2015 (FOREST EUROPE, 2015). The total area for *ex situ* gene conservation was 11,553 ha in 37 countries, and the total area managed for seed production was 1,027,434 ha in 398countries. A total of 145 tree species were reported for this indicator, but a group of five economically important species (*Abies alba*, *Fagus sylvatica*, *Picea abies*, *Pinus sylvestris* and *Pinus pinaster*) accounted for 55% of the total areas managed for *in situ* conservation.

Draft text for a legally binding agreement on forests in Europe

The negotiating process for a possible legally binding agreement (LBA) on forests in Europe was initiated by the FOREST EUROPE Ministerial Conference held in Oslo, Norway, in June 2011. The Conference adopted the Oslo Mandate, in which the FOREST EUROPE Signatories agreed the rules for the negotiating process, and decided to establish an Intergovernmental Negotiating Committee (INC) for the LBA. Subsequently, the LBA negotiations

became a political process parallel to FOREST EUROPE.

The INC was requested by the ministers responsible for forests to complete its work by 30 June 2013. Because the fourth and last session of the INC, held in Warsaw, Poland, in June 2013, was unable to conclude its consideration on all open issues and reach a final agreement, a resumed INC-4 session was held in Geneva, Switzerland, in November 2013, with the aim of finalizing the process. Unfortunately, the resumed INC-4 session also failed to reach an agreement on the draft negotiation text. The outstanding issues in the draft LBA text are mainly administrative and organizational. Unfortunately, the countries did not reach an agreement on the final text.

In October 2015, at the FOREST EUROPE Extraordinary Ministerial Conference, ministers have acknowledged the work of the INC and its outcomes, and, recognizing the great effort invested in the negotiations, have agreed that the draft negotiating text should serve as the basis for future considerations on a LBA on forests in Europe. Ministers have also committed to exploring possible ways to find common ground on the Legally Binding Agreement by 2020 at the latest.

FGR are not explicitly mentioned in the draft LBA text. However, genetic resources are captured under the term "forest biodiversity at all levels", as defined by the CBD (i.e. covering diversity within species, between species and of ecosystems). Article 8a of the draft LBA thus constitutes the most relevant paragraph in the text:

> "Parties shall have in place or adopt legislative, administrative or other policy measures to protect, restore and, where appropriate, increase forest biodiversity at all levels through its effective and efficient integration in sustainable forest management with the aim to halt biodiversity loss and to contribute to reducing forest degradation."

Bioversity International (in its role as the EUFORGEN Secretariat) was also an observer of the INC and presented the wording proposal (developed by the EUFORGEN Steering Committee) to include genetic aspects in the LBA text to the INC-3 session in 2013. As a result of lengthy discussions on biodiversity-related issues, the INC decided to use the term "forest biodiversity at all levels" to keep the text as general and short as possible. The choice of using this term in the text might be considered to be a disadvantage for genetic resources, giving an impression that FGR are less important than other levels of forest biodiversity. However, as one of the objectives of having a LBA on forests in Europe was to reinforce and strengthen the implementation of earlier FOREST EUROPE resolutions, the possible LBAs have the potential to strengthen the ongoing national and pan-European work on FGR in the future.

It is important to keep in mind that the resolutions of FOREST EUROPE on genetic resources (see previous section) and their implementation directly support also the implementation of the possible LBA in the future. Furthermore, concerning the LBA itself, there are several articles and issues agreed upon in the text where proper management of genetic resources will play an important role for the implementation of the agreement, such as "Forest resources and their contribution to global carbon cycles" and "Forest health and vitality". In conclusion, the draft LBA supports the ongoing national and pan-European work on FGR, although the term "genetic resources" is not explicitly mentioned in the text. However, this draft LBA still seems to be far from being signed and enforced.

EU Forest Strategy

The EU Forest Strategy for forests and the forest-based sector (for the period 2014–2020) was approved by the EU Agriculture and Fisheries Council (AGRI) meeting on 19 May 2014. The Council of Ministers invited the European Commission and Member States to implement the EU Forest Strategy and the forthcoming Implementation Plan within their respective competences, consistent with relevant EU and Member State policies and strategies, and paying particular attention to involving stakeholders.

The ministers underscored the importance of the forest-based sector for the EU and the crucial role of forests in making possible the structural transformation of society towards a bio-based economy. They also underlined that while the EU has a variety of forest-related policies, the Treaty on the Functioning of the European Union makes no reference to a common EU forest policy and therefore responsibility for forests lies within the Member States. Nevertheless, the forest sector is affected by an increasing number of EU policy initiatives, such as those dealing with energy, climate, rural development, biodiversity, research, trade and reproductive material. The forest sector's contribution to the preparation of these initiatives needs to be strengthened. The ministers acknowledged that the EU Forest Strategy will enhance coordination and facilitate the coherence of forest-related policies and allow creating synergies with other sectors that influence forest management. The ministers acknowledged that the EU Forest Strategy will enhance coordination and facilitate the coherence between forest-related policies. This new strategy will create synergies with other sectors that influence forest management.

On FGR, the Forest Strategy stresses that:

> "further emphasis should be put on preventing negative impacts on forests rather than on damage mitigation and restoration, and that for forests to be able to react

> to future threats and trends, genetic diversity must be enhanced and endangered genetic resources protected".

The strategy also stresses that:

> "EU Member States should strengthen conservation of FGR (tree species diversity) and diversity within species and within populations."

The EC considers that:

> "…rural development funds should be used to support the implementation of sustainable forest management. Member States should use the opportunities given in the new Rural Development Regulation and prioritise investments in modernising forestry technologies, optimising the sector's contribution to the bio-economy, improving the resilience, environmental value and mitigation potential of forest ecosystems, achieving nature and biodiversity objectives, adapting to climate change, conserving genetic resources, forest protection and information, and creating new woodland and agro-forestry systems."

EUFORGEN is not mentioned specifically in the strategy as an instrument for the coordination of FGR work in Europe. Consequently, it is up to the Member States to decide later what kind of role they wish EUFORGEN to play in the implementation of the new EU Forest Strategy. The EC should consider joining the fifth phase of EUFORGEN (2015–2019) to help Member States reach the FGR-related goals of the EU Forest Strategy, and contribute to the implementation of Strasbourg Resolution 2.

Rural Development Programme

The Rural Development Programme (RDP) is a joint document prepared by the EU Member States and the European Commission outlining eligible measures that can be funded from the European Agricultural Fund for Rural Development (EAFRD). The RDP reflects national priorities as defined by the Member States or regions. Rural development is an integral part of the Common Agricultural Policy (CAP) of the EU. In addition to rural development, the CAP also governs direct payments and common organization of agricultural markets and joint arrangements for the financing, management and monitoring of this policy. The RDPs of the member states are implemented through a set of rural development measures that target amelioration of structural issues in agriculture, forestry, food industry and rural areas in general. The RDPs are also aim to address needs for improving the competitiveness of the agricultural sector (including forestry).

On 17 December 2013, Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by EAFRD was adopted. Article 34 of the Regulation (Forest environmental and climate services and forest conservation, paragraph 4) states that "Support may be provided to public and private entities for the conservation and promotion of FGR for operations not covered under paragraphs 1, 2 and 3". Following Preamble (22) and Article 59, Member States are expected to spend a minimum of 30% of the total contribution from the EAFRD to each RDP on climate change mitigation and adaptation, as well as environmental issues, although this only applies to contributions based on Articles 17, 21, 28, 29 and 30.

To ensure the efficient use of the EAFRD budget, the EC is empowered to adopt delegated acts concerning the types of operations eligible for support under Article 34(4) of Regulation (EU) No 1305/2013. Such a delegated act (i.e. Commission regulation) has not been issued yet, but several measure fiches have been prepared for the delegated act, including the fiche on "Forest environmental and climate services and forest conservation" for Measure 15, which includes conservation of FGR with reference to Article 34.

The Regulation defines a set of eligible measures, while the Member States can decide those measures that they will implement to fulfil the needs identified in conjunction with the Europe 2020 Strategy and the national strategy documents. Therefore, each state can decide for which measures it will seek funding from the EAFRD during the period 2014–2020. Measures on FGR are a new area, which may be viewed by some Member States as a marginal one and not worthy of inclusion in the RDP.

However, it is important that the measures on FGR are developed based on Article 34 and incorporated into the RDPs. Forestry departments within the respective national ministries (or regional governments in relevant countries) should prepare forestry measures for the RDPs and also convince the national coordination bodies that forestry measures are necessary and needed. They should also point out that the RDPs have been identified as a funding instrument for the implementation of the EU Forest Strategy and the EU Strategy for Adaptation to Climate Change.

Priority 4 of the EU Forest Strategy (Protecting forests and enhancing ecosystem services) notes that "*For forests to be able to react to future threats and trends, genetic diversity must be enhanced and endangered genetic resources protected*". It further encourages the Member States to strengthen conservation of tree species diversity as well as diversity within species and within populations. The Forest Strategy concludes that the RDP will be one of the main tools for obtaining financial

resources for the national work on FGR and that national co-funding is expected for this purpose.

The EU Adaptation Strategy to Climate Change was adopted in April 2014. Currently, the Member States are preparing their national adaptation strategies (generally coordinated by the ministry of environment, but the detailed work may be achieved in each technical ministry, sector by sector). These strategies should be finalized in 2015 and their implementation will largely rely on the Operational Programmes of the Environment Sector.

At the same time, this strategy should also be considered as one of the background policies for RDPs in the Member States and regions. When RDPs proposed by the Member States and regions are reviewed by the Commission, their contribution to the goals of the Adaptation Strategy will also be taken into account. However, the Adaptation Strategy itself does not explicitly mention the conservation of genetic resources.

The following list provides potential FGR conservation measures and actions that have been discussed in the context of developing National Rural Development Programmes in some countries:

- Czech Republic: The country will implement contract-based payments for actions in gene reserve forests as part of its RDP. The Act on Forest Reproductive Material has been amended by adding a chapter on the establishment of the National Programme for Forest Genetic Resources. This will support *ex situ* measures that are not included in the RDP.
- Denmark: Conservation of multi-clonal orchards for minor tree species (e.g. *Malus sylvestris*) (combined *ex situ* gene conservation and seed production).
- Greece: Support is planned to the *in situ* network as a pilot initiative. Discussions on *ex situ* measures have been ongoing (establishment of a national forest gene bank).
- Hungary: Buffer zones for gene reserve forests; modifying the composition of tree species and structure of stands; improving natural regeneration; establishing clonal collections; and, as part of Natura 2000, a number of landowners have received financial support for special or modified forest management.
- Slovakia: financial support for conservation and promotion of FGR will be granted per hectare for specific actions in gene reserve forests. Ca. € 3.5 million is intended for this purpose through 5-year contracts with forest owners.

New gene reserve forests, priority tree species and private owners will be favoured. Support for *ex situ* measures, such as conservation or seed orchards, were not accepted into the proposed RDP.

EC Directive on Plant Reproductive Material

The European Commission (DG SANCO) proposed in May 2013 to merge the existing 12 directives on plant reproductive material, including EC directive 99/105 on forest reproductive material, into one common regulation. It also proposed including the control of FRM in a regulation on official controls for food, feed, animal welfare, phytosanitary products, plant health and plant reproductive material.

However, on 13 January 2014, a meeting of the EU Council asked, with more than a qualified majority, the EU Presidency to remove FRM from the EU Commission's proposal on plant reproductive material. This request was confirmed by a Council working party on 12 May 2014. As a consequence, the EC is expected to amend its earlier proposal and leave FRM out of a new seed law. As a result, EU directive 99/105 will remain a specific forest directive.

Despite of this, the "control" part of the new seed law and the Directive 1999/105 on FRM is still likely to be inserted into Regulation 882/2004 relating to the "Official controls carried out to ensure conformity with legislation on animal feed and foodstuffs and with arrangements on animal health and the well-being of animals (official controls)". The new control rules follow risk-based approaches for food security and introduce full control-cost recovery in all sectors, including FRM. Member States are indeed required to ensure that adequate financial resources are available for all control activities.

The control regulation plans to create, in addition to the national competent authorities, liaison bodies as new facilities that will be responsible for administrative assistance and cooperation between Member States. Furthermore, the new regulation would require comprehensive reporting, including multi-annual national control plans to be submitted to the EC. The control regulation also proposes the establishment of European and national reference laboratories and reference centres (there would be one for FRM). The responsibilities and requirements including accreditation for these facilities are oriented towards quality and health control for animals, food and other products including crops. The EC text proposal for control regulation is still under deliberation among Council, Parliament and Commission. It is likely to be adopted by Member States and Parliament in 2016 and would be expected to come into force sometime in 2018.

EU Regulation on invasive alien species

Invasive alien species (IAS) are species that are initially transported by humans to outside of their natural range, across ecological barriers, and that then survive, reproduce and spread, and that have negative impacts on the ecology

of their new location as well as serious economic and social consequences. It has been estimated that of the over 12 000 alien species that are found in Europe, 10–15% have reproduced and spread, causing environmental, economic and social damage. With the 2020 Biodiversity Strategy, the EU committed itself to halting the loss of biodiversity by 2020, in line with the international commitments adopted by the Parties to the CBD in Nagoya, Japan, in 2010.

The impact of IAS on biodiversity is significant. IAS are a major, and growing, cause of biodiversity loss and species extinction. When it comes to social and economic impacts, IAS can be vectors of diseases or directly cause health problems (e.g. asthma, dermatitis and allergies). IAS are estimated to cost the EU at least € 12 billion per year, and damage costs continue to rise. Currently, Member States are taking a number of measures to tackle IAS, but such action remains predominantly reactive, seeking to minimize the damage already being caused, without paying sufficient attention to prevention or to detecting and responding to new threats. Efforts are fragmented, with substantial gaps in species coverage, and are often poorly coordinated. Action taken at national level will be insufficient to protect the Union from the threat of certain IAS. Moreover, this fragmented approach can lead to action in one Member State being undermined by a lack of action in neighbouring Member States.

For these reasons, the EU developed Regulation 1143/2014 on invasive alien species (EU, 2014). The regulation entered into force on 1 January 2015, and aims to address the problem of invasive alien species in a comprehensive manner. The regulation foresees three types of interventions: prevention; early detection and rapid eradication; and management. A list of invasive alien species of EU concern will be developed later with Member States, using risk assessments and scientific evidence. This list should comprise those species for which there is evidence that they are non-native and invasive in a substantial part of the EU (but excluding the outermost areas). In addition, there has to be evidence that they have, or will have, negative impacts on biodiversity, ecosystem services, human health or the economy. Member States will be able to suggest species for the list if they meet these criteria, and even create their own national lists. For each species on the list, a risk assessment and an action plan that analyses the introduction pathways will be prepared and adopted. Preventive measures will also be imposed; for example, it will be prohibited to introduce or transport the species through EU territory, keep or breed it in captivity, nor sell, use or exchange it. However, the regulation does recognize that in some cases a species may be native in one area but an invasive alien in another, and also that in some areas the IAS will not be able to cause significant negative effects. In each case, the Member State can

agree to adopt a containment plan that would prevent further spread. A permit system has proposed for research and *ex situ* conservation, but this will require containment and control measures to ensure there is no escape or spread into the wider environment.

Member States will need to establish a surveillance system to monitor the presence of IAS. If any are detected, then the Commission must be informed and eradication measures put into place by the Member States. Member States can apply for derogation if they can demonstrate that eradication is technically unfeasible, or that the costs will be exceptionally high and outweigh any benefits, or that the eradication measures would have serious consequences for human health or the environment. For those IAS that are already widespread and established, control measures will be required to minimize the impacts of the species. Any control measures would have to be based on a risk assessment and a cost-benefit analysis. The EU will be developing an information system to help coordinate and share information on IAS and to allow countries to report their monitoring efforts.

One of the main challenges for understanding the implications of this regulation for FGR is the process of creating the list of IAS. So far, it is not clear which tree species might be included in the list. Environmental non-governmental organizations (NGOs) might wish to include in the list all non-indigenous pioneer species, and foresters may oppose the inclusion of any exotic species of potential interest for adaptation to climate change. Although there are clear criteria laid out for determining what is invasive and what is not, the level of scientific evidence required is unclear. The regulation does not state whether evidence will be required from peer-reviewed journals or grey literature reports, but would have to rely heavily on national research efforts. Added to that, an economic cost-benefit analysis will have to be undertaken to determine whether action to eradicate or control an IAS would be feasible. If a tree species was to be included on the list, then its use within the EU would be either prohibited, if it was not in the EU yet, or severely curtailed if it was already present. It would be possible for a species to be classified as IAS in one region of Europe but not another. This could cause problems along land borders since the level of regulation will be at the level of Member States rather than bio-geographical regions. It is important to note that plant pests will be outside the scope of this regulation and will remain subject to plant health regulations.

The regulation will struggle to deal with any currently non-invasive species becoming invasive because of climate change, or the opposite situation. In addition, this regulation would not stop a species for which there is no evidence of invasiveness but for which a change of location might cause different behaviour,

e.g. due to lack of natural pests. The regulation works on a weak precautionary principle, only attempting to prevent the spread of known threats rather than trying to avoid currently unknown, but potentially invasive, species from entering the EU region.

Norway, a non-EU country, offers an example of using the "black list" approach for invasive alien species. The list was presented in the report "*Alien species in Norway – with the Norwegian Black List 2012*". The list presents an overview of alien species in Norway and of ecological impact assessments of alien species that reproduce in Norwegian territories. A total of 217 species were assessed to have high or very high ecological risk. Nine tree species (e.g. *Acer pseudoplatanus and Picea sitchensis*) are included in the list. According to the method used, an ecological risk is a function of invasion (dispersal and establishment) and ecological impact. The methodological basis on which the black list was developed for management purposes is disputed. The list is used as a basis for controlling planting of introduced tree species in Norway, which is regulated by the Nature Management Act and the Regulation on the use of foreign tree species for forestry purposes, from 2012. A general Regulation on alien species has been adopted in June 2015 and will come into force on 1 January 2016. It regulates the use of exotic tree species for other purposes than forestry (e.g. garden, parks and ornamental purposes).

Revision of Council Directive 2000/29/EC on organisms harmful to plants

This Directive lays down measures designed to protect Member States against the introduction of organisms harmful to plants and plant products from other Member States or third countries, and to protect Member States against the spread of harmful organisms within the European Union. It covers living plants and living parts of plants, including seeds. The protective measures also relate to the means by which plants, plant products and other related items are moved (packaging, vehicles, etc.).

Pests from other continents are especially dangerous. European plants and trees usually lack adequate genetic resistance against foreign pests, which often do not have natural enemies in Europe. They may jump to previously unaffected host species, spread fast across countries, and cause lasting yield reduction and permanently increase costs for production and control. Eradication of outbreaks of foreign pests can only be successful if all sources of infestation are removed. Apart from outbreaks of quarantine pests on the premises of professional operators, outbreaks may also take place in public or private lands. In those cases, the eradication measures need to include the infested and potentially infested plants in public and private lands in order to be successful at all (any remaining infested plants will act as a source of new infestations elsewhere). The Member States must notify the Commission and the

other Member States of the presence of harmful organisms or the risk of their entering or spreading on their territory.

The Directive requires certain plants and plant products to undergo a plant-health inspection. This inspection must take place at least once a year at the place of production, at appropriate times, i.e. during the growth period or just after harvesting. It applies to plants and plant products at the production site and their growing environment. When the check gives satisfactory results, the national body responsible issues a plant passport attesting compliance with Community plant-health rules. Where the results of a check are not satisfactory, the plants, plant products and growing media concerned may be subject to various measures, such as appropriate treatment (if this is successful, the passport is then issued), movement under official control, or destruction. In addition to plant health inspection, Member States are requested to organize occasional checks, whether at the place where plants or plant products are grown, produced, stored, offered for sale or moved, or at the same time as any other documentary check which is carried out for reasons other than plant health.

The Directive establishes, at the request of one or more Member States, special protected zones to guard against certain harmful organisms. Each zone may cover all or part of the territory of a Member State and must be defined in specific geographical terms and in relation to the harmful organisms concerned. The reason for this protection is the absence of specified harmful organisms in this zone despite conditions favourable to their development.

The European Commission decided to revise directive 2000/29 on harmful organisms and sent a regulation proposal on protective measures against pest of plants to the Council and to the European Parliament on 6 May 2013. Subsequently, the EC issued Commission Implementing Directive 2014/78/EU on 17 June 2014. Its text also covers forest and wood-based materials at all stages, from seeds and seedlings to wood products, an example being NIMP15/ISPM15 obligations to prevent the release throughout Europe of pine nematode.

In Directive 2000/29/EC, pests are listed in specific Annexes.

The new regulation empowers the Commission to list certain quarantine pests as priority pests for the Union, up to a maximum of 10% of the listed Union quarantine pests. Those pests will be subject to an enhanced level of obligations concerning preparedness and eradication, supplemented by enhanced financial support from the Union for the required actions. Pests that affect the intended use of plants for planting, but do not require

eradication, are regulated today under the marketing Directives for seed and plant propagating material and, partly, in Annex II to Directive 2000/29/EC. The proposal categorizes them all as Union quality pests. It sets out the conceptual nature of such pests and subsequently lists them through implementing acts. Criteria to decide whether a pest qualifies as a Union quality pest are provided in special annex of the regulation.

Some of the most dangerous quarantine pests for European forest trees are *Anoplophora chinensis, A. glabripennis, Bursaphelenchus xylophilus, Gibberella circinata, Phytophthora ramorum* and *P. kernovie*. The consequences of these pests for FGR may be huge. The often severe economic losses undermine the profitability and competitiveness of agriculture and forestry. The establishment of new pests may elicit trade bans from third countries, damaging EU exports. Not all pests can be controlled with pesticides and, where available, pesticide use may be undesirable (especially in forests).

This regulation should prevent the most dangerous pathogens for European forests from being released and spread throughout the EU. Therefore, it is very important that the European forest sector:

- through monitoring of forests, constantly survey pest risks for European forests;
- be ready to quickly produce phytosanitary risk analyses to justify promptly setting up efficient measures;
- analyse the consequences of different pests on the conservation of FGR, and propose adapted strategies towards the different pathogens (quarantine, "quality pest", no regulatory action needed); and
- be involved in European and international phytosanitary forums.

SUB-REGIONAL POLICIES

Forest genetic resources within Nordic cooperation

The Nordic Council of Ministers for Fisheries and Aquaculture, Agriculture, Food and Forestry was established in 1952 as a forum for promoting cooperation among the Nordic national parliaments (Denmark, Finland, Iceland, Norway and Sweden, and their autonomous regions), followed by the inauguration of the Nordic Council of Ministers in 1971. The Council of Ministers submits proposals on cooperation, implements the Council's recommendations and reports on results, while directing the work carried out in the targeted areas. The Prime Ministers of the five countries assume overall responsibility for Nordic cooperation, which builds primarily on consultation and coordination, without affecting national sovereignty.

The Nordic Ministerial Declaration on Access and Rights to Genetic Resources in 2003 (the Kalmar Declaration) forms the basis for the work on genetic resources within the cooperation of Nordic countries. Forest tree genetic resources are explicitly mentioned in Paragraph 20 of the declaration:

> "The NORDIC COUNCIL OF MINISTERS Recommends that the Nordic countries initiate a project with the aim of providing a basis for the Nordic countries' decision regarding the legal status of their forest tree genetic resources, but has not identified any reasons to recommend regulation of access;"

In August 2008, the Ministers and Secretaries of State responsible for Forestry in the Nordic countries held a conference in Selfoss, Iceland. The topic of the conference was the importance of forests in facing up to two of the most important environmental challenges of our time: climate change, and the global administration of freshwater resources. The conference concluded with a Ministerial declaration – The Selfoss Declaration on Sustainable Forestry – stating among other things that the ministers "stress the importance of forest tree breeding, including adaptation to a changing climate".

The Nordic Genetic Resource Centre (NordGen), established in 2008, is a Nordic organization under the Nordic

Council of Ministers, dedicated to the safeguarding and sustainable use of genetic resources for agriculture, forestry and food production.

More than 40,000 unique seed accessions, mainly of crops and their wild relatives, are currently maintained in the NordGen genebank. NordGen is also responsible for the operation and management of the Svalbard Global Seed Vault, funded by the Norwegian government, which offers free-of-charge safety back-up for seed collections held in genebanks around the world,. A project has been initiated by NordGen to include also forest tree seed at Svalbard. The first accessions of forest tree seed were deposited at Svalbard in February 2015.

NordGen Forest is a sub-unit of NordGen, consisting of two bodies: the NordGen Forest Regeneration Council and the Working Group on Forest Genetic Resources. The main goal of NordGen Forest is to contribute to the establishment of the best possible Nordic forests for the future, and to serve as a Nordic meeting place for issues related to FGR, breeding and regeneration. The NordGen Forest facilitates annual thematic days and conferences in all the Nordic countries and is an arena for information exchange and dialogue between researchers, managers and practitioners.

As a follow-up to the Kalmar Declaration, NordGen initiated a study called "Seeking appropriate legislation regulating access and exclusive rights to forest genetic resources in the Nordic region" (see Tvedt, 2011). The reports states that there are no problems or obstacles for the forest sector under the current Nordic situation, and therefore the project did not recommend any specific legal steps to be developed.

NATIONAL-LEVEL IMPLEMENTATION OF RELEVANT POLICIES AND COMMITMENTS

A national forest programme (NFP) is a participatory process of policy planning, implementation, monitoring and evaluation at the national and/or sub-national level, aiming at improving sustainable forest management and contributing to sustainable development. The concept was originally adopted by the 4th Session of the UN Intergovernmental Panel on Forests, and it has been further developed in the pan-European context by FOREST EUROPE. Stakeholder participation, iterative processes and a holistic, intersectoral approach are the core principles of the NFP approach.

Because of its predominant position in developing forest policies and because of its strong participatory nature, the NFP is an excellent tool for incorporating the conservation and use of genetic resources into national forest policies and biodiversity conservation strategies.

The FOREST EUROPE process uses NFPs as one of the qualitative indicators for sustainable forest management, but unfortunately the Forest Europe criteria A1 on NFP "National forest programme or similar and related forest policies" do not require incorporation of genetic aspects into NFPs. In 2011, all 37 reporting countries stated that they have a NFP or a similar process in place, with 17 of these countries having formal NFPs. Some countries reported processes guided explicitly by NFP principles, whereas others reported just other processes contributing to sustainable forest management (FOREST EUROPE/UNECE/FAO, 2011).

Finland is an example of a country with a formal NFP that also covers genetic resources. In Finland, the NFP process has emphasized in particular the participation of a wide range of different stakeholders. The NFP was initially prepared by an open and public process among all stakeholders in forest-related issues, and this approach has also been applied during the implementation, follow-up and further development of the NFP. The implementation of the NFP is also part of a Government Programme (a four-year work programme developed by each new government in Finland). The operational structure of the NFP consists of a Forest Council and five permanent working groups in which numerous official bodies and interest groups are represented and involved in

the work. FGR are included in the tasks of the Environmental Benefits working group, as one of the objectives of this group is to halt the decline of forest habitat types and species, and establish a favourable trend in the state of biodiversity. One of the several tasks listed to achieve this goal is

> "to ensure the genetic diversity of forest trees in accordance with the National Programme on Plant Genetic Resources in Agriculture and Forestry, taking into account the international obligations laid down in the EUFORGEN Programme and guidelines issued by the National Advisory Body for Genetic Resources".

Thus the whole national programme on FGR is incorporated in the NFP. This does not provide any extra resources for the work, but makes it possible to discuss genetic issues in a wider forum, including official bodies in the environmental sector and NGOs. Being part of the NFP also helps to maintain awareness of developments in FGR-related policies.

In some other countries there are no formal NFPs, but similar processes that are explicitly guided by the NFP principles. In Norway, for example, there is no single, formalized NFP, but several parallel policy processes, and their documents are considered to jointly constitute the NFP. In several of these policy documents, FGRs and their conservation and use are explicitly mentioned, both in general terms and in recommendations related to production and use of FRM and to mitigation of the effects of climate change.

In the United Kingdom, the most important policy document is the UK Forestry Standard (UKFS). This document was developed through a stakeholder participation process and it defines the national approach to sustainable forest management within the UK through a series of guidelines and statutory requirements. The UKFS states that one objective of forest management should be that forests and woodlands are managed in a way that conserves or enhances biodiversity, with biodiversity being defined as containing all levels of diversity, therefore implicitly including genetic diversity. Furthermore, more explicit genetic aspects are included in general forestry guidelines and biodiversity guidelines. An example of this type of guideline is an instruction to encourage natural regeneration of native tree and shrub species to promote natural selection and climate change adaptation, and conserve distinct genetic patterns. However, the UKFS does not provide a coherent genetic conservation policy and within the UK, forest policy is now devolved to each country (England, Scotland, Wales and Northern Ireland). Currently genetic conservation of forest trees is usually the result of other conservation

efforts. However, efforts are being made to develop a more explicit genetic conservation policy for tree species.

In several countries it has not been obvious that genetic resources should have been included in NFPs and other wider policies. National genetic conservation activities have often been initiated by scientists, sometimes even as part of a research programme rather than a policy process, and sometimes the actual work has been quite advanced before any clear policy has been widely accepted. For example, in France genetic conservation was long considered to be a scientific issue, before becoming in the 1990s a component of the forest policy, and in 2014 a component of the forest law. In Finland, the first gene reserve forest was established in 1992, whereas the National Programme for Plant Genetic Resources in Agriculture and Forestry was not prepared until 2002. The first NFP of Finland was launched in 1999, and although the actors dealing with genetic resources actively participated in the preparation of the document, at that time it was not possible to include genetic conservation and genetic resource management in the NFP. Only after eight years of communication was it possible to include genetic conservation in the NFP during the revision process of the NFP in 2007, as described earlier.

In many countries, communication with various stakeholders has proved to be challenging. Some stakeholders oppose genetic conservation because of a general reluctance to undertake any new conservation activities, whereas nature conservation organizations may feel that conservation of FGR through gene reserve forests is too production-oriented. Underlining these issues may be the question of different interest groups competing for the limited resources available for any kind of conservation. Furthermore, conservation experts sometimes might be unwilling to broaden their views to new types of conservation if they feel that their own expertise is being challenged.

There is tendency in some countries that anything that is not underpinned by a clear legal obligation will be postponed or discarded. A solid legal background for genetic conservation is missing in many countries, although the implementation of the Nagoya Protocol may change this situation. One aspect to be considered with all funding mechanisms and policies is that they normally need clear and measurable indicators for follow-up and evaluation. There is a need to develop measurable indicators to serve both conservation programmes and wider policies. Another problem is that genetic conservation, particularly forestal genetic conservation, is planned and implemented on a long-term basis, whereas most policies need targets that can be achieved within five to ten years.

OPTIONS FOR INCORPORATING FOREST GENETIC RESOURCES INTO NATIONAL FOREST PROGRAMMES AND OTHER RELEVANT NATIONAL POLICIES AND STRATEGIES

Biological diversity is high on the agenda at both the national and international levels in Europe. Many strategies and agreements have already been, or are being, made in order to ensure the persistence of biological diversity. However, these strategies and agreements often take only into consideration diversity at the more general level. Thus, FGR are usually mentioned in strategies and agreements, but very seldom directly addressed specifically. In combination with a primary focus on conservation of species, habitats and ecosystems, there is a considerable risk of neglecting and forgetting FGR. Thus, it is important to make sure that diversity is secured all the way from habitats down to the level of genes and genetics.

In cases where FGR are actually incorporated in national policies and strategies, policy-makers tend to ask how FGR conservation can be transformed into action. There can be several approaches to this.

In Denmark, the approach has been to try and combine several objectives in one approach. For a number of native shrub species there is an urgent need for genetically diverse seeds adapted to the Danish climate. Furthermore, the natural populations of these species are very vulnerable to inbreeding and genetic erosion due to small population sizes and a high level of fragmentation. Thus, these species are not threatened in the sense of being rare, but the native gene pool of these species is endangered. In order to mobilize the native gene pools for a number of these species, seeds were collected in 50 or more autochthonous populations. Seeds were germinated and seedlings were planted in plots. These plots have a dual function: they can be used not only as a seed orchard for seed collection, but also as an *ex situ* living genebank, where genes from valuable autochthonous populations are kept and stored. Thus, if *in situ* populations are lost due to inbreeding, genetic erosion or physical removal, the genetic resources are not lost. This is just one example to show policy-makers how to combine FGR conservation and effective action for the benefit of the forest sector.

In some European countries, valuing ecosystem services and environmental benefits has become an important part of the discussions on environment and

nature protection. What are the values of clean air and clean water, good soils and erosion prevention, for example? If FGR are not directly mentioned in the national strategies, there is the risk that they may be forgotten or overlooked in this process. Furthermore, if you do not know the value of a thing, it seems to be without value. This is another important incentive to make sure that FGR are specifically incorporated in the national strategies and not just mentioned indirectly as part of the overall biodiversity.

Another way to promote awareness of FGR at national level is to establish a separate conservation programme (see Chapter 5). The EUFGIS project showed that many European countries have a genetic conservation programme that includes a number of genetic conservation units for several tree species. Besides their importance in conserving FGR, these units are also a way of showing policy-makers how FGR is transformed into action. Another way of promoting FGR at the national level is through EUFORGEN, which provides an important platform for the exchange of ideas, knowledge and initiatives among countries at the pan-European level. This, in combination with the GPA-FGR and other international initiatives, can be used to push forward and strengthen the FGR work at national level.

CONCLUSIONS AND RECOMMENDATIONS

Forests play an important role in people's lives in Europe, and the forest sector is closely linked to other sectors, such as the environmental and energy sectors, as well to the economy and social welfare. This makes forests and forestry important as such. At the same time, many policies that affect the forest sector are negotiated without sufficient forestry expertise, and consequently the forest sector is sometimes caught out by the policies of other sectors. Many of these policies are currently being re-formulated and changing rapidly, and it is a big challenge for the forest sector to follow and influence these processes from outside of the core group.

The strategies and commitments on biodiversity conservation also create a specific challenge for the work on FGR. There is a general agreement that, by definition, genetic diversity is part of overall biodiversity, and consequently the biodiversity commitments contain a responsibility to include genetic resources in various strategies and work programmes. However, the reality is that if genetic diversity is not specifically mentioned in policy papers, biodiversity is often understood only at the level of habitat and species diversity, and genetic considerations are ignored. It is important to remind policy-makers that there are legally binding international commitments on FGR (such as CBD) to develop and implement national FGR programmes and strategies.

The *State of the World's Forest Genetic Resources* (SoW-FGR) report, which was released by FAO in 2014, constitutes a major achievement that provides useful information for further analyses of current policies and development of national programmes on FGR. The preliminary findings of this report were already used for preparing the GPA-FGR. In 2015, the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) adopted a strategy for the implementation of the GPA-FGR at global, regional and national levels. It is extremely important that European countries also contribute to the implementation of the GPA-FGR.

In conclusion, the key messages and observations are summarized below.

The forest sector is often caught out by policies of other sectors, so it has to

monitor cross-sectoral regulations and to be aware of all regulations with an impact on forestry, and in particular on FGR.

There is a trend toward using "forest biodiversity" in the CBD and other policy documents, instead of specifically referring to "forest genetic diversity and resources". The latter has to be preferred.

Many policies are in a state of flux, making it rather difficult to evaluate their implications for the conservation and use of FGR.

There are both legally binding and non-legally binding international commitments on FGR.

The SoW-FGR report, including the country reports, provides useful information for further analyses of policies and priorities that could be used for developing national programmes on FGR and coordinated policies on FGR at regional and global level in the framework of the GPA-FGR. EUFORGEN could coordinate GPA-FGR at European level.

REFERENCES

Aravanopoulos, F.A., Tollefsrud, M.M., Kätzel, R., Soto, A., Graudal, L., Nagy, L., Koskela, J., Pilipovic, A., Zhelev, P., Božic G. & Bozzano, M. 2015. Development of genetic monitoring methods for genetic conservation units of forest trees in Europe. Bioversity International, Rome, Italy. Xx p.

Behm, A., Becker, A., Dörflinger, H., Franke, A., Kleinschmit, J., Melchior, G.H., Muhs, H.-J., Schmitt, H.P., Stephan, B.R., Tabel, U., Weisgerber, H. & Widmaier, T. 1997. Concept for the conservation of forest genetic resources in the Federal Republic of Germany. *Silvae Genetica*, 46(1): 24–34.

CBD [Convention on Biological Diversity]. 2011. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity. Text and Annex. Secretariat of the Convention on Biological Diversity, Montreal, Canada.

EU [European Union]. 2014. Regulation 1143/2014 on invasive alien species. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1417443504720&uri=CELEX:32014R1143 Accessed 2015-08-13.

FAO [Food and Agriculture Organization of the United Nations]. 2014. *State of the World's Forest Genetic Resources*. Available at http://www.fao.org/3/a-i3825e.pdf Accessed 2015-08-13.

FOREST EUROPE/UNECE/FAO. 2011. State of Europe's Forests 2011. Status and Trends in Sustainable Forest Management. FOREST EUROPE Liaison Unit Oslo, Aas, Norway.

FOREST EUROPE, 2015: State of Europe's Forests 2015. FOREST EUROPE Liaison Unit Madrid, Spain.

Geburek, T. & Konrad, H. 2008. Why the conservation of forest genetic resources has not worked. Conservation Biology, 22(2): 267–274.

Graudal, L., Kjaer, E.D. & Canger, S. 1995. A systematic approach to the conservation of genetic resources of trees and shrubs in Denmark. Forest Ecology and Management, 73(1-3): 117–134.

Koskela, J., Buck, A. & Teissier du Cros, E. (eds.). 2007. Climate change and forest genetic diversity: Implications for sustainable forest management in Europe. Bioversity International, Rome, Italy.

Koskela, J., Vinceti, B., Dvoral, W., Bush, D., Dawson, I.K., Loo, J., Kjaer, E.D., Navarro, C., Padolina, C., Bordács, Jamnadass, R., Graudal, L. & Ramamonjisoa, L. 2014. Utilization and transfer of forest genetic resources: A global review. *Forest Ecology and Management*, 333(Special Issue): 22–34.

Laikre, L., Allendorf, F.W., Aroner, L.C., Baker, C.S., Gregovich, D.P., Hansen, M.M., Jackson, J.A., Kendall, K.C., McKelvey, K., Neel, M.C., Olivieri, I., Ryman, N., Schwartz, M.K., Bull, R.S., Stetz, J.B., Tallmon, D.A., Taylor, B.L., Vojta, C.D., Waller, D.M. & Waples, R.S. 2010. Neglect of genetic diversity in implementation of the Convention on Biological Diversity. *Conservation Biology*, 24(1): 86–88.

Mayer, P. & Buck, A. 2005. A Look at Pan-European Forest Policy: the Ministerial Conference on the Protection of Forests in Europe and the ´Living Forest Summit´. Pp. 33–43, in: Th. Geburek and J. Turok (eds.). *Conservation and Management of Forest Genetic Resources in Europe*. Arbora Publishers, Zvolen, Slovakia.

Teissier du Cros, E. (ed.). 2001. Forest Genetic Resources Management and Conservation. France as a Case Study. Ministry of Agriculture and Fisheries, Bureau of Genetic Resources and Commission of Forest Genetic Resources, Paris, France.

Tvedt, M.W. 2011. Seeking Appropriate Legislation Regulating Access and Exclusive Rights to Forest Genetic Resources in the Nordic Region. FNI Report 9/2011. Fridtjof Nansen Institute, Lysaker, Norway.

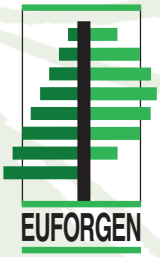
ANNEX 1

Summary table of the Strategic Priorities (SP) of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (GPA-FGR)

Priority Area 1 **Improving the availability of, and access to, information on 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 level			
SP 1. Establish and strengthen national FGR assessment, characterization and monitoring systems	SP 5. Strengthen the contribution of primary forests and protected areas to *in situ* conservation of FGR	SP 12. Develop and reinforce national seed programmes to ensure the availability of genetically appropriate tree seeds in the quantities and of the (certified) quality needed for national plantation programmes	SP 18. Develop national strategies for *in situ* and *ex situ* conservation of FGR and their sustainable use
SP 2. Develop national and sub-national systems for the assessment and management of traditional knowledge on FGR	SP 6. Promote the establishment and development of efficient and sustainable *ex situ* conservation systems, including *in vivo* collections and gene-banks	SP 13. Promote restoration and rehabilitation of ecosystems using genetically appropriate material	SP 19. Update FGR conservation management needs and integrate them into wider policies, programmes and frameworks of action at national, regional and global levels
	SP 7. Support assessment, management and conservation of marginal and/or range limits forest species populations	SP 14. Support climate change adaptation and mitigation through proper management of FGR	SP 20. Develop collaboration and promote coordination of national institutions and programmes related to FGR
	SP 8. Support and develop sustainable management and conservation of FGR on farmland	SP 15. Promote appropriate use of emerging technology to support the conservation, development and sustainable use of FGR	SP 21. Establish and strengthen educational and research capacities on FGR to ensure adequate technical support to related development programmes
	SP 9. Support and strengthen the role of forests managed by indigenous and local communities in the sustainable management and conservation of FGR	SP 16. Develop and reinforce research programmes on tree breeding, domestication and bio-prospection in order to unlock the full potential of FGR	SP 22. Promote the participation of indigenous and local communities in FGR management in the context of decentralization
	SP 10. Identify priority species for action		

Priority Area 1 Improving the availability of, and access to, information on 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**
	Regional level		
	SP 11. Develop and implement regional *in situ* conservation strategies and promote ecoregional networking and collaboration		SP 23. Promote and apply mechanisms for germplasm exchange at regional level to support R&D activities, in agreement with international conventions
			SP 24. Reinforce regional and international co-operation to support education, knowledge dissemination, research, and conservation and sustainable management of FGR
	International level		
SP 3. Develop international technical standards and protocols for FGR inventories, characterization and monitoring of trends and risks		SP 17. Develop and promote networking and collaboration among concerned countries to combat invasive species (animal, plants and micro-organisms) affecting FGR	SP 25. Encourage the establishment of network activities and support development and reinforcement of international networking and information sharing on FGR research, management and conservation
SP 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			SP 26. Promote public and international awareness of the roles and values of FGR
			SP 27. Strengthen efforts to mobilize the necessary resources, including financing, for the conservation, sustainable use and development of FGR

Source: FAO, 2014. Available at http://www.fao.org/3/a-i3849e.pdf Accessed 2015-08-14


EUFORGEN