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**Directorate General for
Agriculture and Rural
Development**

**Preparatory action on
EU plant and animal genetic resources
(AGRI-2013-EVAL-7)**

WORKSHOP REPORT

**Implementation of the Global Plans of Action (FAO):
which role for the EC ?**

21st April 2016, Bonn

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The Workshop took place in the context of the study launched by DG AGRI of the European Commission called "*Preparatory action on EU plant and animal genetic resources*" which is being conducted by a Consortium of experts and consultants. It started in July 2014 for a duration of 2 years to create an overview of actors, networks, activities and issues regarding conservation and sustainable use of GR in Europe.

A total of seven workshops have been organized in the period June 2015 – April 2016. Each workshop was dedicated to specific topics/issues linked to a specific regional context and/or covering sectorial or methodological issues in the field of genetic resources. These workshops covered the four different domains under scrutiny: AnGR, PGR, FGR, and MiGR.

The outcomes of the workshops should provide recommendations concerning approaches and solutions applicable for the conservation and sustainable use of GR, reflecting the objectives and themes of the preparatory action.

More information on the objectives of the study can be found on the study website: <http://www.geneticresources.eu>.

The Workshop is the seventh of the series and covered the implementation of the Global Plans of Action for genetic resources (FAO) and the role for the European Commission within this context.

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1 Introduction

The seventh workshop of the preparatory action titled “**Implementation of the Global Plans of Action (FAO): which role for the EC?**” was held in Bonn, Germany on April 21 2016. It was prepared by:

- **Dan Leskien** (FAO); and
- **Frank Begemann** (Federal Office for Agriculture and Food (BLE), Germany)

The following additional experts provided significant input towards the success of the workshop in their capacity as presenters:

- **Annette Schneegans** (European Commission, DG AGRI)
- **Stefan Schroeder** (Federal Office for Agriculture and Food (BLE), Germany)
- **Lorenzo Maggioni** (ECPGR, Secretary)
- **Danijela Bojkovski** (ERFP, Secretary)
- **Sven de Vries** (EUFORGEN)
- **Marizeth Groenewald** (CBS Fungal Biodiversity Centre, The Netherlands)
- **Catherine Labbe** (INRA)
- **Eva Thörn** (Member of ECPGR Executive Committee)
- **Jeanne Bormann** (Chair of ERFP Task Force “EU matters”)
- **Mari Rusanen** (Member of EUFORGEN Working Group on “Policies and Conservation of FGR”)

The first part of Workshop 7 gave an overview of national and international activities for the conservation and sustainable use of genetic resources in the different domains. After this, the current EU activities in this context were presented. In the final panel discussion all participants were invited to debate on the right measures of EC to complement the FAO actions.

2 Background

Value of plant and animal genetic resources

Plant and animal genetic resources for agriculture and food production are the biological basis of global food and nutrition security. Apart from their potential economic importance (contributing with specific qualities to breeding programmes or producing quality products for niche markets), local or regional breeds and varieties are also of key socio-ecological importance. For instance, they might be adapted to specific environmental conditions (e.g. landscape management in marginal areas that depend on grazing; breeds that cope better than high-performance breeds with conditions of organic agriculture or extensive cultivation). Moreover animal and plant genetic resources are part of our cultural heritage.

FAO actions

The Food and Agriculture Organisation of the United Nations (FAO) designates the conservation and sustainable use of genetic resources as important factors for food security and nutrition. Already in 1983, the FAO Conference adopted the “International Undertaking on Plant Genetic Resources”. This was actual the birth of the Commission on Genetic Resources for Food and Agriculture (CGRFA). The Commission got its present name in 1995, when the FAO Conference broadens the Commission’s mandate to cover all components of biodiversity of relevance to food and agriculture.

The first report to **The State of the World’s Plant Genetic Resources for Food and Agriculture** has been finished in 1996 and published in 1998.

The Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture was adopted by The International Technical Conference on Plant Genetic Resources, held in Leipzig, Germany in 1996.

In 1997 the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture and the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture were founded to deal with specific matters in their areas of expertise.

The **International Treaty on Plant Genetic Resources for Food and Agriculture** was adopted by the Commission in 2001 and entered into force on 29 June 2004. The **Second Report on the State of the World’s Plant Genetic Resources for Food and Agriculture** followed in 2010 and in 2011 the **Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture** was adopted by the FAO Council.

The first report to **The State of the World’s Animal Genetic Resources for Food and Agriculture** was presented on the International Technical Conference on Animal Genetic Resources for Food and Agriculture in Interlaken, Switzerland in 2007 and was followed by the adoption of the **Global Plan of Action for Animal Genetic**

Resources. The second report to **The State of the World's Animal Genetic Resources for Food and Agriculture** was published in 2015.

Following to the first report to **The State of the World's Forest Genetic Resources**, the **Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources** has been adopted by the FAO Council in 2013 (<http://www.fao.org/nr/cgrfa/cgrfa-about/cgrfa-history/en/>).

At its 15th Regular Session, the FAO Commission on Genetic Resources for Food and Agriculture agreed to establish the Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources (for Food and Agriculture), specifically with the task to guide the preparation of and review the **First State of the World's Aquatic Genetic Resources for Food and Agriculture**. This report should be finished before the CGRFA session in 2017 (<http://www.fao.org/fishery/AquaticGeneticResources/en>).

Overview of Global Plans of Action and their strategic priorities:

First Global Plan of Action for Plant Genetic Resources for Food and Agriculture (adopted in 1996)

Priority Activities

- In Situ Conservation and Development
- Ex Situ Conservation
- Utilization of Plant Genetic Resources
- Institutions and Capacity Building

Global Plan of Action for Animal Genetic Resources (2007)

Strategic Priority Area 1:

Characterization, Inventory and Monitoring of Trends and Associated Risks

Strategic Priority Area 2:

Sustainable Use and Development

Strategic Priority Area 3:

Conservation

Strategic Priority Area 4:

Policies, Institutions and Capacity-building

Second Global Plan of Action for Plant genetic Resources for Food and Agriculture (2011)

Priority Activities

- In Situ Conservation and Management
- Ex Situ Conservation
- Sustainable Use
- Building Sustainable Institutional and Human Capacities

Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (2013)

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

All these Global Plans of Action have in common, that one of their strategic priorities is "Institutions and capacity-building". This includes both, the development of national programmes or strategies, as well as the building of international networks.

Capacity building – regional networks

In 1980 the **European Cooperative Programme for Plant Genetic Resources (ECPGR)** (formerly "European Cooperative Programme for Crop Genetic Resources Networks - ECP/GR") was founded on the basis of the recommendations of the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO) and the Genebank Committee of the European Association for Research on Plant Breeding (EUCARPIA). (<http://www.ecpgr.cgiar.org/about-ecpgr/overview/>)

Since 2001 the **European Regional Focal Point for Animal Genetic Resources (ERFP)** is the regional platform to support the in situ and ex situ conservation and sustainable use of animal genetic resources (AnGR) and to facilitate the implementation of FAO's Global Plan of Action for AnGR. (<http://www.rfp-europe.org/about-erfp/>)

The European **Forest Genetic Resources Programme (EUFORGEN)** was established in October 1994 as an implementation mechanism of Strasbourg Resolution S2 (Conservation of forest genetic resources) of the first FOREST EUROPE

Ministerial Conference, held in France in 1990. (<http://www.euforgen.org/about-euforgen/>)

More detailed information to history, structure and objectives of these three networks is given in the summaries and the presentations (attached to this report).

There is no comparable network built up in AqGR until now. In MIGR there are several national and international networks. It would be conducive to connect these networks to each other.

Policies

The conservation and sustainable use of genetic resources for food and agriculture (GRFA) is a widely supported international objective as they provide the biological basis for agricultural production and world food security. Over the past 30 years, there have been a number of major developments in the form of international agreements (e.g. the Convention on Biological Diversity (CBD), the Agenda 21 in 1992 which is not a legal instrument but which has a high political importance and it includes conservation and sustainable use of animal and plant genetic resources, the Global Plans of Actions from the FAO, the Nagoya Protocol and the International Treaty on Plant Genetic Resources for Food and Agriculture addressing conservation and use of GRFA of which we mention the main ones.

The EU has been addressing conservation and use of genetic resources for agriculture in a series of legislations and activities. The framework conditions set-up for sustainable agriculture through the Common Agriculture Policy of the EU (CAP) have been significantly improved in recent years. With the CAP's so-called "*health check*" in November 2008, the EU Council of Agriculture Ministers adopted a resolution to give stronger support to agriculture in mastering the new challenges, including climate change as well as biodiversity issues, and to further develop the resolutions adopted in the agricultural reform in 2003. The agri environmental measures are an essential instrument in helping to attain these CAP goals. The legislative foundation for funding the agricultural activities is Regulation (EC) No. 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD Regulation). Furthermore the seed marketing directives regulating the placing to the market of plant varieties are controlled at both national and European level. Legislation has been adapted in 2008 as issues were faced when growers were interested in old heritage varieties. Changes to EU legislation have been introduced by the so called Conservation Varieties Directives, which are implementing various measures for the marketing of conservation and 'amateur' varieties and preservation mixtures. The Commission Implementing Decision of 18 March 2014 on the organisation of a temporary experiment providing for certain derogations for the marketing of populations of the plant species wheat, barley, oats and maize pursuant to Council Directive 66/402/EEC is particularly important for some traditional landraces. Very important for

the livestock sector is the EU zoo-technical legislation which provides a legal structural framework for the breeding, the trade in and entry into the EU of purebred breeding animals of the bovine, porcine, ovine, caprine and equine species and hybrid breeding pigs. Besides the improvement of the functioning of the internal market and trade with third countries, the legislation which has been renewed in 2014/2015 and will apply in 2018, contains a set of specific rules for promoting endangered breeds and genetic diversity within and across breeds (e.g. derogations for performance control and genetic evaluation, possibility for reconstruction of “lost” breeds, derogations for the upgrading of animals into the main section of breeding books, possibility to refuse additional breeding programs in case of endangered breeds, possibility to create a EU reference center for endangered breeds (through an implementing act), derogations for cross border activities in case of seasonal movements of animals).

Alongside this, there are various EU Action Plans with relevance for the conservation of agricultural biodiversity (e.g. GENRES projects, the European multi-annual Research Framework Programmes, the Framework Programme or successor legislation (Horizon 2020), LIFE+ is the EU's only dedicated fund for the environment and the European Innovation Partnership (EIP) which is a new approach to Research and innovation in the EU, the EU quality policy (creation of PDOs, PGIs for products originating from specific breeds, varieties).

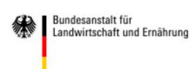
3 Agenda of the Workshop

The agenda was divided into two parts. In the first part, the participants should become an overview of the present national and international activities for the conservation and sustainable use of genetic resources in Europe. Therefore members of the three important networks ECPGR, ERFP and EUFORGEN presented their sectors. Furthermore experts for MIGR and AqGR gave a speech. After this, Ms Schneegans (DG AGRI) showed what the EU is already doing in this matter. The second part of the agenda was a panel discussion with experts from all sectors and the subsequent overall discussion to point out what EC should do to complement FAO actions.

Thursday 21st April 2016

8.30 - 9.00	<i>Registration</i>	
9.00 – 9.10	Welcome of participants	Frank Begemann, BLE
9.10 – 9.20	Introduction by European Commission	Annette Schneegans, European Commission
9.15 – 9.30	Reminder of the objectives of the preparatory action Objectives of the workshop	Stefan Schröder, BLE

Preparatory Action on EU plant and animal genetic resources



9.30 – 10.00	Conservation and sustainable use of genetic resources for food and agriculture - – Global perspectives and regional needs	Dan Leskien, FAO
10.00 – 10.30	<i>Coffee break</i>	
10.30 – 11.00	National and international activities for the conservation and sustainable use of plant genetic resources	Lorenzo Maggioni, ECPGR
11.00 – 11.30	National and international activities for the conservation and sustainable use of animal genetic resources	Danijela Bojkovski, ERFPP
11.30 – 12.00	National and international activities for the conservation and sustainable use of forest genetic resources	Sven de Vries, EUFORGEN
12.00 - 12.30	National and international activities for the conservation and sustainable use of microbial and invertebrate genetic resources	Marizeth Groenewald, CBS
12.30-14.00	<i>Lunch break</i>	
13.30 - 14.00	National and international activities for the conservation and sustainable use of genetic resources for aquaculture	Catherine Labbe, EFFAB/Fish
14.00 – 14.30	EU activities for the conservation and sustainable use of genetic resources for food and agriculture	Annette Schneegans, European Commission
14.30 - 15.30	Panel discussion (4 experts explaining in 10 minutes each what EC should do to complement FAO actions) Eva Thörn, (member of ECPGR Executive Committee) Jeanne Bormann (ERFP Task Force “EU matters”) Mari Rusanen (Member of EUFORGEN Working Group on „Policies and Conservation of FGR) Marizeth Groenewald (for the MGR domain)	Chairs: Frank Begemann, BLE Dan Leskien, FAO
15.30 – 16.00	Overall discussion and conclusion	Chairs: Frank Begemann, BLE, Dan Leskien, FAO

4 Summary of the presentations (*setting the scene*)

The programme was built around eight presentations and the final panel discussion. The presentations are included in the Annex to this report. The summary of each of these presentations reads as follows:

Welcome of participants

Frank Begemann welcomed all participants and opened the workshop.

Introduction by European Commission

Annette Schneegans provided the background which led to funding of two EU preparatory actions, this being the 2006-2011 Community Programme on Genetic Resources as well as expert recommendations following evaluation of the programme. While the on-going preparatory action is meant to give a comprehensive overview of activities related to genetic resources in the EU (plant/animal/forest/microbes), the second preparatory action will help to compile examples for valorisation and use of neglected and underutilised breeds and varieties.

Reminder of the objectives of the preparatory action Objectives of the workshop (Stefan Schröder, BLE)

Stefan Schröder presented relevant facts about the EU preparatory action on EU plant and animal genetic resources. He explained the different tasks, themes and objectives of this project.

The main objectives of this workshop were:

- the sharing of knowledge,
- the identifying of needs and priorities, as well as
- the identifying of necessary actions for the implementation of the Global Plans of Action on Genetic Resources for Food and Agriculture (FAO).

Conservation and sustainable use of genetic resources for food and agriculture – Global perspectives and regional needs (Dan Leskien, FAO)

The Commission on Genetic Resources for Food and Agriculture (Commission), established in 1983 by the Food and Agriculture Organization of the United Nations (FAO), addresses all components on biodiversity relevant to food and agriculture. Originally responsible for plant genetic resources only, the Commission mandate

embraces since 1995, all genetic resources and it has implemented this mandate in a stepwise manner. With its currently 178 Members, the Commission is the only intergovernmental body that specifically deals with the conservation and sustainable use of genetic resources and biodiversity for food and agriculture.

The Commission's 'work cycle' consists of: (i) country-driven global assessments; (ii) policy and technical instruments the Commission develops with the assistance of its intergovernmental technical working groups on plant, animal, forest and aquatic genetic resources in response to the global assessments; (iii) the implementation of the policy instruments by the Commission and its member countries; (iv) regular monitoring of the implementation of Commission instruments based on country reports which also feed into the next global assessment. In principle, this work cycle should lead every ten years to an updated global assessment of plant, animal, forest and aquatic genetic resources and of biodiversity for food and agriculture. FAO launched in the beginning of this year The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture. Currently under preparation are the first global assessments of aquatic genetic resources and of biodiversity for food and agriculture.

At each phase of the Commission's work cycle, coordinated efforts and approaches by the seven FAO regions, including the European Region, may benefit the regions' as well as the Commission's work. Regional consultations are usually held in the preparation of global assessments to exchange lessons learnt and identify regional needs and priorities that may form the basis of a policy response the Commission may later decide on. Regional synthesis reports which FAO usually prepares for the regional consultations allow the regions to analyze their situation and to develop regional strategies and actions, as appropriate. Prior to Commission sessions, the regions usually hold regional consultations in Rome to coordinate their views and positions. This facilitates the regions, but also the Commission's work immensely as it allows every region to speak on important issues with one voice and to exchange views and coordinate with other regions prior to sessions of the Commission. Regional coordination and interregional assistance and support also play an important role for the implementation of the Commission's instruments, the Global Plans of Action as well as the technical instruments. Regional technical networks, such as the ECPGR, may also play an important role in this regard: as a model for regional coordination and cooperation and as support mechanism that may also assist other regions in their efforts to produce country reports or to implement the Commission's instruments. Regional coordination networks are often related to particular subsectors of genetic resources for food and agriculture. The on-going preparation of country reports for The State of the World's Biodiversity for Food and Agriculture offers an opportunity to consider regional coordination networks with a scope expanding beyond the different subsectors of genetic resources and to establish/ improve coordination mechanisms addressing the conservation and sustainable use of all genetic resources for food and agriculture, of associated biodiversity and cross-sectoral matters that are of relevance to more than one subsector.

National and international activities for the conservation and sustainable use of plant genetic resources (Lorenzo Maggioni, ECPGR)

The European Cooperative Programme on Plant Genetic Resources (ECPGR) is a collaborative Programme among most European countries, aiming at rationally and effectively conserve ex situ and in situ plant genetic resources for food and agriculture (PGRFA) in Europe and increase their utilization. The Programme, which was started in 1980, is guided by a Steering Committee (SC), consisting of National Coordinators (NCs) of the member countries, who are nominated at the governmental level. The SC nominates an Executive Committee composed of four NCs and a Chair, to plan and execute the ECPGR activities, as decided upon by the SC. Coordination of the Programme is ensured by a Secretariat, currently hosted by Bioversity International in Maccarese (Rome), Italy. The Programme operates through 18 crop and 3 thematic Working Groups (WGs), each led by a Chair. They carry out collaborative activities partly using funds assigned through a grant scheme and partly as inputs-in-kind. The budget of ECPGR (annually ca. € 520,000) is currently provided by 38 countries and is dedicated to run the Secretariat, the activities of the Steering Committee and of the Working Groups, and the maintenance of the European catalogue EURISCO.

Specific objectives and activities of ECPGR during its Phase IX (2014-2018) match very well the main themes of the Global Plan of Action:

- 1. In situ conservation and management:** ECPGR has developed a concept on crop wild relatives which offers guidance for national and regional conservation strategy planning. The strategies involve compilation of taxa checklists, prioritization of the lists, inventory of the prioritized taxa and eventually designation and management of Most Appropriate Wild Populations that are rich in genetic diversity and traits of interest. A parallel concept on landrace populations is being developed.
- 2. Ex situ conservation** is addressed through the establishment and operationalization of A European Genebank Integrated System (AEGIS). This involves the establishment of a decentralized European Collection of unique and important accessions. Through a formal Memorandum of Understanding, member countries commit to long-term conservation and management of European Accessions and to their availability, according to the terms and principles of the FAO International Treaty on PGRFA. A quality system is also organized, based on agreed standards and on coordinated reporting, monitoring and capacity building. AEGIS currently involves 34 member countries and 58 institutions. The European Collection has reached over 26,500 designated accessions.
- 3. Sustainable use.** The objective of ECPGR is to strengthen relationships between genebanks and users of germplasm. Working Groups are solicited to carry out activities in this direction. Sustainable use is also promoted through the AEGIS initiative, by increasing access to material, including non-Annex I taxa, expanding characterization and evaluation of PGRFA and increasing availability of data through the ECPGR databases.
- 4. Building sustainable institutional and human capacity.** These GPA-related objectives are implemented by ECPGR in various ways. The maintenance of a comprehensive European information system (EURISCO) about ex situ accessions is a significant infrastructure, which is planned to be expanded to gather data on in situ material. National programmes strengthening, networking activity and capacity building are other inherent and relevant outcomes of the ECPGR operations.

Throughout the years, the role of the European Commission (EC) vis-à-vis ECPGR has been indirectly supportive, through the provision of relevant project funds under

different schemes (GEN RES, Research Framework Programmes and recently Horizon 2020). However, a stronger and possibly formal collaboration between the EC and ECPGR might ensure better coherence, continuity and impact towards the implementation of the GPA in Europe. In the proposed scenario, the EC might become a formal member of ECPGR and/or could adopt EURISCO and AEGIS as EU-funded infrastructures. ECPGR could help the EC to develop a European Strategy on PGRFA and could eventually provide the European Union's technical Secretariat for coordination of PGRFA matters and/or for project administration.

National and international activities for the conservation and sustainable use of animal genetic resources (Danijela Bojkovski, ERFP)

The European Regional Focal Point for Animal Genetic Resources (ERFP) was initiated in 1998 and became formally operational in 2001 as the European part of FAO's global coordination structure for animal genetic resources which is based upon national and regional focal points. Today the ERFP is the regional platform to support the in situ and ex situ conservation and sustainable use of animal genetic resources, to enhance the National Coordinators (NCs) activities at the European level and to facilitate the implementation of FAO's Global Plan of Action for Animal Genetic Resources in Europe.

The objectives of the ERFP are:

- To support the in situ and ex situ conservation and sustainable use of AnGR in European countries.
- To facilitate the implementation of the Global Plan of Action for AnGR in Europe.
- To assist and enhance the AnGR activities of NCs at the European level.
- To develop and maintain regular contact and exchange of relevant information on AnGR horizontally between European NCs and EAAP and vertically with the Global Focal Point in Rome using existing structures.
- To stimulate the funding and organisation of regional projects, research, workshops and national programmes for AnGR within the European Region.
- To maintain an appropriate liaison with the European Institutions, the FAO Commission on Genetic Resources for Food and Agriculture, the Secretariat of the Convention on Biological Diversity and regional and international NGOs. For scientific aspects, it is supported by the European Association of Animal Production's Working Group on Animal Genetic Resources (EAAP WG-AGR).
- To stimulate and coordinate the maintenance and further development of national and regional AnGR databases and to encourage European information networking on AnGR.

The organisational core of ERFP consists of the Assembly of NCs, Steering Committee (SC) and Secretariat. Working Groups consisting of NC's or other experts in the

member states are the most important tools in the activities coordinated by the ERF. Some short-term work may be carried out with Task Forces responding to very acute needs. The Assembly may also ask a named group to carry out Ad hoc actions related to the needs of the common ERF programme or the needs of the Secretariat as issues arise. The ERF activities are carried out inter alia through Working Groups, Task Forces and Ad hoc actions such as projects. Over the years of functioning a lot of successful projects, workshops and Ad hoc Actions were completed. The results of those activities can be seen at the ERF website (<http://www.rfp-europe.org/>).

National and international activities for the conservation and sustainable use of forest genetic resources (Sven de Vries, EUFORGEN)

Sven de Vries, on behalf of the EUFORGEN programme, gave an overview on the activities related to the conservation and sustainable use of forest genetic resources (FGR), in the framework of the implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources¹ (GPA-FGR) in Europe. The GPA-FGR, based on the first “State of the World’s Forest Genetic Resources² (SoW-FGR)” report, has 4 priority areas and 27 strategic priorities. Two of these strategic priorities are relevant for Regional collaboration in Europe:

- 11: “Develop and implement regional *in situ* conservation strategies and promote ecoregional networking and collaboration” and
- 24: “Reinforce regional and international cooperation to support education, knowledge dissemination, research, and conservation and sustainable management of FGR”.

The EUFORGEN programme, plays a unique role in facilitating the implementation of the GPA in Europe, in particular concerning the strategic priority 11.

EUFORGEN (European Forest Genetic Resources Programme³) 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 a resolution adopted by the first Ministerial Conference of the FOREST EUROPE process on the conservation of FGR⁴.

Over the past several decades, European countries have made considerable efforts to conserve the genetic diversity of tree species, all countries following similar approaches (ie a network of *in situ* genetic conservation units). According to the EUFGIS portal⁵, there are more than 3200 genetic conservation units that harbour more than 4000 populations of about 100 tree species. An analysis of the EUFGIS information revealed significant gaps in the conservation efforts in terms of the species

¹ The full GPA-FGR is available from: <http://www.fao.org/3/a-i3849e.pdf>

² For more information about the report and to download, please visit: <http://www.fao.org/forestry/fgr/64582/en/>

³ More information available at www.euforgen.org

⁴ More information on FOREST EUROPE process available at <http://www.foresteurope.org>

⁵ <http://portal.eufgis.org>

covered and the geographical distribution of the units within the species' ranges; with the aim to have a common approach in filling these gaps, the EUFORGEN programme developed the "pan-European genetic conservation strategy for forest trees", that aims to create a network of units, by defining a target of genetic conservation at pan-European level. The overall goal of the strategy is to maintain adaptive and neutral genetic diversity of forest trees at pan-European level. Countries are committed to the establishment of new units in the areas identified as gaps. The strategy provides an effective national and regional basis to operate, allowing monitoring of progress and definition of priorities

The pan-European strategy provides a framework for countries to plan and implement their conservation work. While the implementation of the strategy remains the responsibility of each country, through the implementation of this strategy, EUFORGEN-member countries support the implementation of the GPA-FGR, at national and international levels.

National and international activities for the conservation and sustainable use of microbial and invertebrate genetic resources (Marizeth Groenewald, CBS)

Microbial genetic resource (MiGR) centres worldwide have an extremely important role underpinning the conservation of microbial biodiversity and their ex situ preservation. The general principle is that ex situ collection approaches should be complementary to promote conservation and sustainable use of the microbes. In situ conservation of MiGR is not generally carried out and monitored and often it is assumed that the microorganisms will look after themselves and therefore information on this is very limited. Several EU projects have been launched in the past few years that focussed on aspects linked to the conservation of microorganisms and how to harmonise microbial preservation within the EU (eg. EMbaRC, GBRCN, GIBA). One of the main problems for co-ordination of conservation and use of MiGR of relevance to food and agriculture in Europe is the huge variation in the type of organisms, their current usage and potential. Several networks or infrastructures of microbial resources exist already at national, regional and global levels such as BCCM, CNR, ECCO, INRA, MIRRI, Q-collect and WFCC. The aims of many of these networks are the same; exchange and implement best practices, harmonize international standards and regulations and stimulating interaction between different stakeholders. The question to be addressed is how possible future networking, collaboration approaches and co-ordination can contribute to a more effective and efficient strategy for conservation and sustainable use of MiGR in food and agriculture in Europe without duplicating what already is done in existing national and regional networks; the focus should be on filling the gaps and strengthening the collaboration between them. Another problem that the MiGR community is facing is that partnerships and better communication are needed between users, resource holders, industries and funders. This should also be done through more structured multidisciplinary interactions.

Ex situ conservation of some microbes taken from their natural environments is not possible as they cannot be grown in culture or the ex situ culturing conditions used are not optimal. There is therefore a need to address important issues such as finding means of monitoring environmental microbial samples and keeping all organisms that are present in environmental mixed samples alive and active. For this reason, if only traditional ex situ conservation methods are used many important microorganisms will be lost. The development and implementation of new technologies, including isolation and preservation methods and methods for accurate characterization of the microbes such as Next Generation Sequencing can improve our understanding of microbial diversity and function and provide information to address key issues such as soil fertility. The risk of genetic erosion and the associated loss of microbial biodiversity in natural environments is big and investments should be made to monitor this. It is important to find means to preserve the microbial-soil interactions by in situ conservation of these MiGR in their natural environments. Multi-disciplinary (environmental, plant, animal, microbial etc.) strategies for the conservation of endangered organism communities are needed as micro-organisms are involved in complex interactions in their natural surroundings.

National and international activities for the conservation and sustainable use of genetic resources for aquaculture (Catherine Labbé, Department of Fish Physiology and Genetics, INRA Rennes, France, on the behalf of EFFAB and Fabre TP (Jan Venneman, Courtney Hough)

Aquaculture is the fastest growing animal food producing sector in the world, and this young sector is characterized by a high degree of technical innovation. However, at the European scale, aquaculture has been facing a stagnation phase for the last few years, if one excludes the steady growth observed in Norway. Spain, UK, France and Greece produce 2/3 of the EU28 aquaculture products. The main marine species produced are Atlantic salmon (half the marine production in tons), gilthead sea bream and European sea bass. The main shellfish are mussel and pacific oyster, and the main freshwater species are rainbow trout (3/4 of the freshwater production) and common carp. Aquaculture breeding activities was recently reviewed by Chavanne et al, 2016 (Aquacult Int). In Europe, more than 46 breeding programs are being operated, the most represented species being the rainbow trout (15 breeding programs, the oldest one being at its 15th generation of breeding) followed by the gilthead sea bream, European sea bass, Atlantic salmon, common carp and turbot. Most of the breeding programs are advised by public or private consultancies, but some companies whose core business is selective breeding have their own genetic staff and software capacity (mostly in salmon). The programs include individual-based and family-based methods, mostly based on marker assisted selection and/or parentage assignment. Five programs are already using genomic selection. Traits under selection are broadening, from the initial growth and disease resistance traits to feed efficiency, morphology,

processing yields and product quality. Today, the majority of EU fish production is from improved seeds (although the ratio is only 10 % at the world scale).

Biotechnologies in aquaculture production are well developed, especially for reproduction and gamete production management. This includes the production of all-females stocks (obtained from sex-reversed males), of sterile females (after triploidisation by pressure shock), and the control of maturation and gamete release by light synchronization and hormonal induction. For all species under breeding programs, semen cryopreservation is mastered. Note that only paternal material can be cryopreserved. Active research programs are currently being developed to bypass the egg and embryo cryopreservation bottleneck (use of immature germ cells, of somatic cells). Some countries are organizing centralized and collective cryobanks where improved material is safely stored (ex CryoAqua bank in France). However, cryobanking networking at European scale is nonexistent and a model has to be set up (ownership, dissemination, sanitary regulation, common centralized tool dealing with the resources management).

The main organizational bottleneck for European aquaculture and genetic resources management is the cost of genetic improvement when so many species with only limited production are farmed in Europe, and when improved material sells at the standard market price. Besides, there is little sharing of genetic resources, therefore no global networking, possibly because of the high parent fertility, and the high competition between programs. At the regulation level, a protection policy for innovation and improvement of genetic material has to be invented, with respect to maintaining access of the farmers to affordable material. Besides, Nagoya protocol implementation is pending. Farmers are facing difficulties to access to new farming sites (environmental issues), difficulties with sanitary regulations and hormonal drugs allowance.

Networking and knowledge exchange between actors in genetic resource is very active at the research level, thanks to several EU funded projects. Industry is networking mainly through the activity of EFFAB, FABRE TP and EATIP.

EU activities for the conservation and sustainable use of genetic resources for food and agriculture (Annette Schneegans, DG AGRI)

Genetic resources are cutting across several policies and competences at EU level. While the Convention on Biological Diversity, Nagoya and other biodiversity policies/activities are dealt with by DG Environment; ITPGRFA and seed legislation are overseen by DG SANTE and patents (incl. in breeding) by DG GROW. DG AGRI promotes the use of GenRes in agriculture and forestry through its funding for Rural Development Programmes as well as through research and innovation activities under Horizon 2020, together with DG RTD. .

Overall, there is significant recognition of the importance of genetic resources in environmental, social, cultural and economic terms, both in Europe and globally.

Previous and current European Framework Programmes have provided continuous support to conservation, restoration and use of genetic resources for agriculture and forestry. For example:

- Throughout FP5/FP6 the International Cooperation Programme has provided continued support to underutilised crops
- Under FP6 FOOD programme: Research on genetic resources was less visible but to some extent embedded in major genomic projects, such as EU-SOL, BIOEXPLOIT, GRAIN LEGUMES
- Under FP7: Three projects were specifically dedicated to improving use of plant genetic resources (CWR, landraces). Other breeding oriented projects contributing to conservation, characterisation and use
- Horizon 2020: First two work programmes (WP) of Societal Challenge 2 (WP 2014/2015 and WP 2016/2017) have systematically tackled genetic resources, both in-situ and ex-situ and foster the use of genetic resources through value chain approaches

Funding under the current research programme Horizon 2020 has increased openings for more applied research and allows moving towards closer-to-market activities. It is also promoting collaborative or "multiactor approaches to research, thus allowing for different types of knowledge creation and sharing. With regard to research and innovation in the area of GenRes the multiactor approach has led to stronger involvement of the farming sector and GenRes stakeholders other than genebanks and researchers.

Funded and on-going projects have developed a wealth of knowledge, methods and infrastructures that are helping us to better characterise, conserve and use GenRes for agriculture and forestry. Significant efforts however are still required, e.g. to improve the status of collections in genebanks (in quantitative and qualitative terms), information systems, cooperation between GenRes holders or the connections between in-situ and ex-situ conservation efforts.

Possible points for discussion at the workshop include how to better link European and global efforts to support GenRes (including the development of strategies and tools for conservation, models for governance and funding), how to improve the interoperability of information systems, or how to foster public and private collaboration to promote the use of GenRes.

What EC should do to complement FAO actions?

Statement to Plant Genetic Resources (Eva Thörn, ECPGR)

Conservation of PGR is not a project it is forever and has to rest on stable core funding. Plant-breeding is everlasting work needed to combat and mitigate various threats appearing regularly. Joint forces and collective resources for conservation of PGRFA and related activities in Europe are needed. Time and resources on establishment of new infrastructures should not be wasted, instead existing resources should be used. In Europe there are well-functioning networks such as ECPGR, EUFORGENE and others which could act as EU technical Secretariats for coordination and administration of GRFA matters.

EU is lacking a common strategy for conservation and use of PGRFA therefore EC urgently needs to establish such a strategy. ECPGR will be at disposal for the task offering available strategies as supporting documents.

To enable and increase the use of CWR and landraces clear strategies for both conservation and use is needed. ECPGR has prepared and adopted a CWR strategy and is about to adopt a strategy for On Farm Conservation and Management of PGRFA. EC could consider adopting these two strategies and turn them into an EU directive, eventually also establish a central coordinating body for their implementation taking into consideration existing coordinating platforms.

Insufficient resources and scarce funding have increased the risk of losing parts of the valuable collections in Europe. AEGIS, the ECPGR virtual gene bank system, intends to facilitate the providing of material of good condition accompanied by relevant and useful information. But not possible without resources. AEGIS is legally founded by the ECPGR member states but also needs an EU legal framework for its operation. Core funding is needed as well as additional funding for activities such as characterization, evaluation, regeneration etc. It might also be necessary to resume the discussion on a common physical European or EU gene bank.

In order to maintain a diversified agriculture and satisfy specific and local needs and desires public breeding and small breeding companies are needed. The smaller actors will need additional support in order to compete and deliver the results that society, policymakers and stakeholders are expecting. Continued long-term project funding with focus on local and regional needs and preferences, promotion of Public Private Partnerships (PPP), regional collaboration and investments in pre-breeding are some efforts to consider. Policies and legislations urgently need to be changed in order to support an innovative research environment and breeding community.

Efforts needs to be put into the diversification in the field and agricultural production such as niche production and varieties for marginal land. The ECPGR strategy for On Farm Conservation and Management includes a number of concrete actions to meet these needs and demands.

ECPGR as THE plant network in Europe could serve to a much greater extent as the technical implementation and coordination platform for capacity building services.

EURISCO could be further developed and used to collect and extract information and data i.e. monitoring and safeguarding of genetic diversity. A recognition of EURISCO as the official European database and the adoption of EURISCO as well as AEGIS by the EC as EU-funded infrastructures is needed.

ERFP Position paper (Jeanne Bormann, ERFP)

An increasing world population calls for sustainable intensification of agricultural production under changing environmental, climatic and societal conditions. Under these circumstances, animal genetic resources are considered as a safety-net and genetic pool for adapting to changing conditions for within and across breed improvement. A large richness in biodiversity supports future innovative solutions. Animal genetic resources show multiple values: they are source of food and nutrients in a variety of supply chains and they deliver agro-ecosystem services and are an integral living part of the cultural heritage. Animal genetic resources are impacted both positively and negatively by the existing policy and regulatory framework. The European Regional Focal Point (ERFP) on Animal Genetic Resources (AnGR) is the regional platform to support the *in situ* and *ex situ* conservation and sustainable use of AnGR and to facilitate the implementation of the Global Plan of Action (GPA) for AnGR in Europe. ERFP would like to emphasise the following important role of the EC in connection with the activities of ERFP and the implementation of the GPA:

- Providing financial support for ERFP as the regional platform to support and to promote the *in situ* and *ex situ* conservation and sustainable use of AnGR through funding and organisation of regional projects, research, workshops and national programmes for AnGR within the European Region.
- To support the projects carried out by ERFP on technical assistance; exchange of best practices and state of the art knowledge, coordination of training and research, development of regional policies, awareness raising, between all EU countries, in the field of conservation and sustainable use of AnGR.
- Early involvement and consultations of the EC with the ERFP experts in the area of AnGR. ERFP representing the interests of all Member States through its participative structure based on National Coordinators would like to offer to the EC technical support for strategy and policy development and evaluation.
- ERFP is the FAO Regional platform for Europe, represented by the National Coordinators of countries in Europe and may play an important role in connecting the objectives of the GPA with EU policies and regulations related to the conservation and sustainable use of AnGR.
- Long-term funding for the development, maintenance, characterization and documentation of cryobanks at regional, national, transnational or even (pan-) European level needs to be ensured. EC could play an important role in co-funding these important infrastructures for long term conservation and sustainable use.
- EC should set a favorable policy environment for further improving the economic viability of activities related to the conservation and sustainable use of AnGR. The favored principle should be conservation through utilization. This can be achieved by further promoting the creation of tradable outputs of breeds in terms of food and non-food products, either through traditional products or by creating new innovative products, or through the provision of breed related services. Appropriate support needs to be provided for the promotion of these products and efforts should be

undertaken also at EU level for public awareness raising on the expected beneficial effects originating from the diversification of food products and agro-ecosystem services provided by local breeds.

- A favorable policy environment should enable increased cooperation between the various stakeholders in the value chain. This may be done through regional, national and transnational cooperation models. Examples could be the set-up of joint quality schemes or umbrella labels covering different products and services of local species, breeds, varieties or lines of plant or/and animal origin.
- A favorable policy environment is needed to further improve knowledge linked to the characterization and breeding aspects of local breeds and facilitating the access and exchange of local breeding animals and their genetic material.
- A favorable policy environment is needed for improving knowledge on the qualities, usability, and adaptability of breeds. This can be achieved by encouraging the knowledge mapping on breeds as regards their breed assets, also in terms of their genetic adaptive capacity to social, economic and ecological conditions and their traditional use, by involving breeders, breeding organizations and various stakeholders.
- Support the progress in the genomic and phenotypical characterization of breeds based on scientific principles and encouraging the exchange of knowledge and expertise.
- Development of a favorable policy environment which supports capacity building in the area of conservation and sustainable use of AnGR, carrying on and further developing legal instruments supporting, creating enabling environments for conservation and sustainable use of AnGR.

Statement on Forest Genetic Resources (Mari Rusanen, EUFORGEN)

Forest genetic resources have a lot in common with crops and animal genetic resources, but they also have some special features which have to be taken into account in gene conservation strategies.

Most of forest tree species' seeds can be stored for a very short time, compared to the time needed to regenerate the seed lot: in some cases even few months vs several decades. Tree species are also very much dependant on other species in the ecosystem, therefore we need to conserve genes in their ecosystems and their adaptive processes. This is why the gene conservation strategies for forest trees emphasize the in situ conservation of both the material itself and the dynamic processes that influence the genetic composition of the species. The main goal is to conserve the adaptive potential of the species or the population, not so much single genotypes. This also means that each country has specific genetic quality that other countries do not have.

When a conservation programme is dependent on material staying in place, all countries in the species' distribution area are needed to take part in conservation. EUFORGEN as a networking programme has already proved to have a key role in developing a joint conservation strategy for European countries, as well as helping in the implementation. EUFORGEN is a unique platform to exchange information and to share knowledge and it is also functioning successfully as an interface between

scientists, forest managers and policy makers. The programme as a whole has collective knowledge than no single country could ever have.

Countries have individually agreed to support the GPA and are already doing so. Part of the GPA is implemented at regional level, which is presently supported by the countries through the international collaboration in the EUFORGEN programme.

The only way for the countries that are contributing to the strategy (and for Europe as a whole) to ensure that the diversity is properly conserved is when all countries are part of the programme.

So, this is a plea for all countries in Europe to participate in this programme and for the commission to ensure this is possible. If only half of the countries are able to support this international effort the programme does not have great chance to succeed because

- i) the workload for the development of the strategies is on the shoulders of few,
- ii) the cost to support the work and its coordination are charged on few countries and, even more important,
- iii) part of the genetic resources of the species are not part of the strategy

Conserving forest genetic resources is a long term, never ending process and cooperation is the only way to tackle the whole genetic diversity of the forest tree species. Participating in the dialogue, contributing to the development of the strategies and especially implementing strategies and agreement at national level is a great contribution the European countries are already doing and are committed to continue in the future. More than half of the costs of EUFORGEN are used for the networking activities and the development and implementation of the strategies. We have to identify the most appropriate way to support this dialogue in a way that will allow all EU member countries (and also candidate and neighbor countries) to equally participate and contribute.

EUFORGEN-member countries are committed to continue to support the implementation of the Global Plan of Action, by implementing regional in situ conservation strategies (work in the field, identification of new valuable populations, extension of the effort to under-conserved species and active conservation of these resources) and contribute to the networking activities (contribution to development of new strategies and to the practices-science-policy interface /dialogue).

The long-term existence of a networking programme like EUFORGEN is the best strategy the EU can have for the conservation, sustainable use and development of forest genetic resources. The role we see for the Commission is to ensure that the overall coordination is supported for the long-term and that all EU and neighbour countries have equal possibility to contribute to the work. This would best be achieved by identifying suitable ways to ensure that adequate funding is allocated to support the existence of the networking programme.

Statement on Microbial and Invertebrate Genetic Resources (Marizeth Groenewald, CBS)

1. Microbial *ex situ* collections throughout Europe need constant financial support, especially the smaller collections that are not linked to research facilities. Together with the EC there should be looked at ways for continuous financial support to ensure the self-sustainability of small specialised collections that focus on specific niches and products and make them more available for the user community.
2. Natural ecosystems containing rare, endemic and threatened microbial communities and have to be conserved. Many of the microbes in these communities are not culturable and it is usually not clear what the necessity of the interactions between the microbes and the plants/insects/animals are. Specific case studies are needed to address the big challenges that exist in areas that are still not well explored such as soil fertility and mitigation for climate change. The EC can play a role in financing projects on a more persistent basis.
3. Limited tools are available to measure the impact of changes in the environment (eg. climate, erosion) on the microbial populations. The outcome of studies supported by the EC can provide structured approaches to implement new technologies and metagenomics in such studies in order to get a better understanding on how such data and information can be used to develop the necessary tools.
4. Different MiGR conservation programmes (in situ and ex situ) need to link in situ conservation of mixed communities an important issue. Specific case studies are needed to address the big challenges that exist in areas that are still not well explored such as soil fertility and mitigation for climate change. This can be done in a coordinated way through projects or financing through the EC.
5. More efforts are needed to supply adequate up to date information. There is a need to promote success stories. This can be done through outreach from projects that involved genetic resources and led to the production of specific products. It is therefore important to know who from the EC can be contacted or informed regarding such success stories etc. It is now not clear as conservation issues are not the responsibility of one person but falls under a variety of people.
6. The EC can help to indicate mediators that will be necessary to strengthen the collaboration between different sectors/stakeholders
7. Several national and regional MiGR network infrastructures in Europe. Many of these activities focus on the same issues/problems – collaboration and coordination is necessary instead of reinventing the wheel. Microbial resource research infrastructure (MIRRI) is a good starting point in trying to connect all the existing networks and infrastructures in EU with each other. MIRRI unfortunately still needs extensive country involvement. The EC can play a part

in this by also make it clear to the member states that a pan-EU infrastructure such as MIRRI is necessary to ensure the save conservation of all MIGR available in EU.

5 Summary of the discussions on the presentations and the final panel discussion

Thanks to the interesting presentations and statements, the panel discussion and the active discussion of all participants the following items could be concluded:

1. Long-term funding for *in situ/on farm* and *ex situ* conservation of genetic resources for food and agriculture

A key element of the FAO global plans of action for genetic resources is the long-term conservation *in situ*, on farm and *ex situ*. These forms of conservation are different for plant, animal, forest or microbial genetic resources. While such conservation structures are partly existing it became evident that long-term conservation is at risk in various situations.

For plant genetic resources traditional genebanks have developed over decades. A European Genebank Integrated System (AEGIS) has been created at a European level by the European Cooperative Programme for Plant Genetic Resources (ECPGR) to support conservation of European collections. However, it is evident that today various national genebanks are facing serious financial risks. In recent years, some genebanks even had to be closed. In addition, community genebanks exist in various European countries; but if they do, they are in need of more permanent support. *In situ* conservation of crop wild relatives in Europe is just in its infancy due to a lack of an official framework and its implementation. The primary means of conserving CWR diversity *in situ* is in actively managed genetic reserves (either within existing protected areas (PAs), in newly designated PAs or outside PAs in less formally protected sites) with complementary conservation management of samples in *ex situ* facilities that will at least in the short-term be the usual mode of access for germplasm users. Besides, on farm conservation or management is a specific approach where traditional or farmers' varieties, conservation varieties, amateur varieties or other landraces are managed by farmers or gardeners. These activities are wide-spread throughout Europe. Farmers or gardeners engaged in on farm conservation or management usually maintain small quantities of seed for the respective varieties or landraces. Hence at a European level, the conservation of plant genetic resources is not secured in the long-term.

For animal genetic resources, conservation traditionally takes place more or less *in situ* by farmers. Many rare breeds, however, cannot compete with high-

yielding breeds and qualify for support. Therefore, some support measures are in place within the rural development support schemes to compensate for losses due to lower production levels of rare breeds. These support measures can be offered by member states but their nature remains voluntary. A European network of so-called “ark farms” (ArcaNet) has been developed by the SAVE-Foundation supported partly by project funding. A long-term security for farmers is not provided. Complementary, several countries have developed genebanks for animal genetic resources. In addition, a European Genebank Network for Animal Genetic Resources (EUGENA) is currently under development within the framework of the European Regional Focal Point for Animal Genetic Resources (ERFP). In many countries such genebanks do however not exist and the genebanks that do exist did not necessarily capture all genetic diversity still available in the country. It can be concluded that an effective and efficient long-term conservation of animal genetic resources is not existing at European level.

For forest genetic resources the gene conservation strategies for forest trees emphasize the *in situ* conservation of both the material itself and the dynamic processes that influence the genetic composition of the species. The main goal is to conserve the adaptive potential of the species or the population, not so much single genotypes. All countries in the species’ distribution area are needed to take part in conservation. Hence, the European Forest Genetic Resources Programme (EUFORGEN) played a key role in developing a joint conservation strategy for European countries, as well as helping in the implementation. Unfortunately, not all countries support the implementation of the regional strategy yet and not all forest species are covered so far.

Genetic resources of microorganisms and invertebrates occur in a wide range of ecosystems. Natural ecosystems contain endemic and threatened microbial communities and need to be conserved. Many of the microbes in these communities are not culturable and the interactions between the microbes and the plants/insects/animals are not yet fully understood. Microbial *ex situ* collections are usually linked to research institutes. The European Culture Collections’ Organisation (ECCO) or the Microbial Resource Research Infrastructure (MIRRI) provide for a good starting point in trying to connect all the existing networks and infrastructures. However, so far a sound European strategy for conservation of genetic resources of microorganisms and invertebrates and sufficient commitment by all European countries is still lacking.

In summary, a stable and long-term funding for *in situ*, on farm and *ex situ* conservation of genetic resources for food and agriculture is needed at European level.

2. More legalized framework for conservation and sustainable use of genetic resources for food and agriculture

In Europe, conservation and sustainable use of genetic resources for food and agriculture is governed by many different legal instruments. These instruments have been developed to serve particular interests either in plant breeding and seed trade, in animal breeding, nature conservation, rural development or research. These different sector policies are not connected. A comprehensive view is yet to be applied to link the conservation and sustainable use of the different genetic resources and the different conservation approaches as well as the different opportunities for their direct or indirect use in agriculture, research, breeding or for nutrition.

A more legalized framework is lacking to provide for a coherent and mutually supportive European policy framework for conservation and sustainable use of genetic resources. Such a framework is needed to provide also for an additional incentive or even commitment for a stable and long-term funding for *in situ*, on farm and *ex situ* conservation of genetic resources for food and agriculture at European but also national level. Cross-sectoral collaboration between the different national or EU authorities for agriculture, forestry, fishery, environment, research and consumer protection is needed.

3. Collective regional activities (based on individual countries)

Genetic resources consist of species diversity and diversity within species. These species and their related infra-specific differentiations (populations, breeds, landraces, strains etc.) do not know national boundaries or jurisdictions. Their occurrence or habitats are trans-boundary by nature and depend on the environment, ecosystems or historical developments rather than on country policies today. A regional perspective is needed for most parts of the genetic resources for food and agriculture, including forestry.

As costs are involved for conservation and sustainable use of genetic resources for food and agriculture national commitment and measures are the basis for any regional impact. Collective regional activities are, however, more cost-effective and efficient to address conservation of genetic diversity of trans-boundary species and their related infra-specific differentiations.

Examples of regional conservation activities are the European *ex situ* genebanks systems AEGIS, EUGENA or ECCO/MIRRI as well as the *in situ* conservation approaches in EUFORGEN, the Arca-Net, the on farm conservation network Let's Liberate Diversity or *in situ* reserves for crop wild relatives. Similarly, the regional rural development schemes or research programme Horizon 2020 provide for complementary support of regional activities.

The further development of such regional collaborative activities is needed to make full use of Europe's potential in this area.

4. Existing networks stand ready to assist (ECPGR, ERFP, EUFORGEN, ECCO)

European networks for plant (ECPGR), animal (ERFP), forest (EUFORGEN) and microbial (ECCO) genetic resources exist. These networks provide platforms for collaborative activities and regional cooperative infra-structures as well as for communication and information exchange at a European regional level. These networks stand ready to assist in any further development of additional regional measures for conservation and sustainable use of their respective domains.

While ECPGR, ERFP and EUFORGEN are established by the member states and are government-based networks their role for implementing and monitoring the FAO global plans of actions is not equal and partly lacking. Their recognition and potential opportunities in the preparation towards the FAO processes or European Union measures or positions is either lacking or at least under-utilized. A formal commitment of the European Union including the European Commission for these government-based networks or other networks of the civil society as indicated above is not yet existing. These networks currently operate based upon voluntary individual or institutional commitment. In order to be fully operational and effective the networks would require long-term financial support from the EU.

5. Inter-linkage between conservation and sustainable use

Conservation and sustainable use of genetic resources are inter-related. Some conservation approaches such as on farm management of plant or animal genetic resources (e.g. community seed banks or ark farms) require the use of the landraces / farmers' varieties or breeds in farming systems and production. The development of new products, even if only for niche markets at the beginning, can have a positive impact for the size of the landrace or breed population. In this sense the development of value chains give an added value to such products. Markets have to be developed if products should successfully be offered to the consumer. Market development requires however expertise which is usually scarce at farm level. It is rather a matter for producer cooperatives. Farmers and producer cooperatives need however resources for the development of new products or marketing of traditional but forgotten products. Often they lack knowledge in appropriate marketing. As the appropriate processes or mechanisms are not plant or animal specific but rather cross-cutting issues an effective framework for the development of such value chains of plant or animal origin is needed.

6. Additional coordination, information and knowledge exchange at regional/ EU level

Genetic resources are affected by different policies including agriculture, forestry, fishery, environment, research or consumer protection. This is the case at national level but also in the European Commission. For example, some aspects are covered by DG AGRI, others by DG SANTE, DG RESEARCH or DG ENVI. For better transparency and information as well as for enhanced coordination and knowledge exchange one single contact point for matters related to genetic resources for food and agriculture is needed at country level and in the European Commission. An comprehensive and up-to-date overview of the different responsibilities for the various tasks related to genetic resources for food and agriculture is lacking.

7. Consideration of indicators and monitoring of associated biodiversity

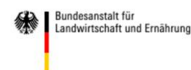
The first report on the State of the World's Biodiversity for Food and Agriculture shall be presented on the Sixteenth Regular Session of the FAO's CGRFA in 2017. This overall report and the additional reports for plant, animal, forest and aquatic genetic resources provide an excellent knowledge base at global level. The implementation of national and regional activities in Europe should ideally be based upon these global assessments.

In future, achievements will therefore need to be based upon agreed indicators and a European monitoring system for agricultural biodiversity including genetic resources for food and agriculture. A European strategy for agricultural biodiversity is however lacking.

ANNEX 1: List of participants

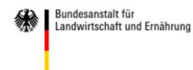
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Preparatory Action on EU plant and animal genetic resources



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Preparatory Action on EU plant and animal genetic resources



ANNEX 2: Presentations

See attached files