EUROPEAN
COMMISSION

Brussels, 28.11.2013
SWD(2013) 486 final

COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

Report from the Commission to the European Parliament, the Council and the Economic and Social Committee

Agricultural Genetic Resources - from conservation to sustainable use

{COM(2013) 838 final}

COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

Report from the Commission to the European Parliament, the Council and the Economic and Social Committee

Agricultural Genetic Resources - from conservation to sustainable use

1. INTRODUCTION

The Commission launched, in 2004, a specific "Community programme on the conservation, characterisation, collection and utilisation of genetic resources in agriculture established by Council Regulation (EC) No 870/2004' to address genetic resources (GR) conservation in agriculture.

The Community programme provides co-funding for 17 actions which were implemented by around 180 partners in 25 Member States and 12 non-EU countries. The budget allocated to co-funding actions established under the programme was EUR 8.9 million, to be spent over a four-year period. Twelve actions concerned plant GR — notably cereals, fruits, vegetables, grapevine, spices, and forest resources. Actions aimed at enhancing the morphological and genetic knowledge of plant GR and at disseminating results to scientists and end-users. The remaining five actions concerned the conservation of farm animals' GR. They aimed at formulating and establishing strategies and guidelines for conserving livestock biodiversity, including EU-level coordination of semen cryo-preservation (freezing) and the creation of a European database for farm animal species and breeds.

As provided for in Article 14 of the above Regulation, a group of independent experts (hereinafter: the expert group) was requested to report on the implementation of the Regulation, to assess the results, and to make appropriate recommendations. The group's report, together with the Commission's comments, is to be submitted to the European Parliament, the Council and the European Economic and Social Committee. This Working document summarises the results of the evaluation report, presents the Commission's comments, and explores options for future action.

2. EVALUATION OF THE COMMUNITY PROGRAMME

In line with the legal requirement, an expert group was convened, based on a call for expression of interests, to assess the results of the Community Programme and to make recommendations. To complement and feed into the evaluation work, the Commission conducted a stakeholder consultation.

2.1. ACHIEVEMENTS

The expert group assessed the results of the programme and concluded that the programme's objectives in terms of conservation, characterisation, collection and use of GR had been effectively addressed and globally achieved.

Conservation activities concerned various farm animals, crops and forest trees, both *in-situ* and *ex-situ*, and several thousand new accessions were collected, characterised and evaluated. The expert group noted that the programme had helped to establish conservation infrastructures, databases, core collections, gene-banks and accession catalogues. These were welcomed as good and useful outcomes of the actions. The

direct use of GR resulted in breeding programmes, in the formulation of guidelines, and in the exchange of genetic material between programme participants and end-users (farmers, breeders, gardeners). The evaluation emphasised that the programme advanced the scientific knowledge on the nature, management and potential of various agricultural GR, but that some important species were missing.

The requirement for actions to be transnational, as laid down in the Regulation, helped to build effective cross-border cooperation and to stimulate contacts and active networking. Dissemination activities, training, workshops and direct contacts with end-users and industries were facilitated within the programme. The information exchange between beneficiaries in different countries was recognised as a positive outcome that was highly appreciated by the beneficiaries. This cooperation helped to share concerns and created EU added value.

The expert group considers that the Community programme stimulated considerable attention among stakeholder groups on the importance of conservation activities, reflecting the need for action in agricultural GR conservation.

The expert group concludes that the programme was most valuable in terms of advancing the understanding of local practices and needs and of contributing to the sustainability and profitability of agriculture.

2.2. WEAKNESSES

The expert group noted that the beneficiaries of the programme were mainly research institutes and emphasised the need for a wider participation of end-users in order to achieve the programme's objective of *using* GR more efficiently and to strike a balance between *ex-situ* and *in-situ*/on-farm conservation activities.

The expert group suggested that the funding rate and the administrative requirements did not encourage end-users to participate in the programme, and recommended that these issues be addressed in relation to future activities.

According to the expert group, the low attention given to dissemination activities to and information exchange with wide range of stakeholder groups was due partly to the dominance of the scientific community in the implementation of the actions. The expert group criticises that the programme results did not appear to have fully reached the end-users, even where these results might have been relevant to them. The expert group therefore pointed to limitations in valorising the outcomes for agricultural practice.

The expert group welcomed the establishment of conservation infrastructures but expressed concerns about their long-term viability, considering the high cost of maintaining and updating these infrastructures. The need to ensure that end-users had open access to databases was also underlined.

2.3. RECOMMENDATIONS

The expert group recommended setting up another Community programme, with particular focus on the use of GR, as one of the main objectives to be pursued. It underlined the need for better involvement of end-users, for more emphasis on *in-situ* conservation, and for closer cooperation with Small and Medium-sized Enterprises (SME) with a view to integrating GR conservation into the wider economic context. To encourage end-user participation, the expert group suggested getting stakeholders involved in establishing a new GR programme and recommended looking for ways of reducing the administrative burden for beneficiaries.

The expert group underlined that EU added value should be achieved by harmonising efforts, policies and programmes on agricultural GR more effectively across all Member States. Better coordination of relevant EC programmes should generate economies of scale, avoid overlaps, create synergies, and ensure better end-user involvement. At the same time, the expert group underlines that conservation activities should take into account the climatic, financial and cultural specificities and differences across Member States.

According to the expert group, the scope of the programme should be widened to freshwater and marine aquaculture. Attention should also be given to interactions between microbes and farm animals/crop plants as well as to plant species of relevance to biomass production.

The expert group also recommended encouraging a more effective and comprehensive transfer of results to potential end-users. By harnessing scientific and technological developments towards practice application, in line with needs, the programme could more effectively interlink applied research and end-users. Given the high cost of long-term conservation, the expert group suggested supporting activities with potential for generating income for end-users, so as to make GR conservation self-supporting.

3. APPRAISAL OF EVALUATION RESULTS

The Commission staff appreciates the evaluation report as a particularly useful input into the formulation of future activities concerning the conservation of Genetic Resources in agriculture. It shares the view that, while the objectives of the programme remain pertinent, further prioritisation shall be envisaged. This should result in a better balance between *ex-situ* and *in-situ*/on-farm conservation and give more emphasis to dissemination and encouraging enhanced involvement of end-users. As underlined in the evaluation report, a better balance between 'Targeted'[1], 'Concerted'[2] and 'Accompanying'[3] actions should be ensured. This has direct implications on dissemination and information activities, on the funding rate (increase from 50% of targeted actions to 80% of concerted and accompanying actions), and on the wider participation of stakeholders. Ways and means need to be sought to mobilise traditional knowledge and combine farmers' expertise with innovative approaches, in order to generate economic, environmental and social benefits.

The Commission staff agrees with the expert group that the scope of the programme should be widened, that EU activities should foster the conservation of GR of particular interest for agriculture, and that the regional perspective should be taken into account. The Commission also endorses the view that EU added value can be achieved by harmonising and reinforcing coordination of policies and programmes to achieve economy of scale, to create synergies, and to make it easier to identify gaps and shortcomings. Instrumental in this respect would be the development of common guidelines on conservation activities and the establishment of joint databases on GR collections and gene banks.

---

1 Directly addressing the conservation, characterisation, evaluation and use of GR, and conservation facilities.

2 Exchange of information to improve coordination.

3 Information, dissemination and advisory measures.

The Commission staff shares the view that GR conservation should be interlinked with innovative initiatives in order to combine its potential for economic growth with the establishment of sustainable practices. Cooperation among stakeholders and knowledge exchange between researchers, farmers and other actors should help to valorise GR conservation and exploit its potential in a way which is economically viable. The Commission agrees that close-to-market actions and short food supply chains can strengthen local systems, develop niche markets, generate economic opportunities and facilitate viable GR conservation. Beside agro-environment-climate measures to purely support conservation of endangered breeds and crops under threat of genetic erosion, the proposal for Rural Development Policy 2014-2020, provide for measures to valorise agricultural GR into the production chain. In particular, measures supporting quality schemes (Art. 17) can be used to promote products with given quality derived from local and/or traditional breeds and crops. In this context, making consumers more aware can be an important element and needs to be specifically addressed. Furthermore, measures targeting Local Action Groups (Art. 42) can be used for setting up and support diverse, collaborative local activities in the context of conservation of GR as well as their valorisation.

4. CONCLUSIONS

In its evaluation report, the expert group noted the valuable results in terms of agrobiodiversity conservation achieved by the Community programme and recommended pursuing the objectives of conserving, characterising, collecting and utilising GR. The expert group underlines the need for coordinated programmes and activities as well as for major, lasting efforts in securing GR in agriculture, while pointing to the need for significant budget resources for both science-related actions (e.g. genetic and phenotypic characterisation, evaluation, storage infrastructures, coordinated databases and inventories) and practical actions directed at farmers and other end-users. To encourage the involvement of those categories of actors who are less familiar in setting up and conducting programmes' activities, the group of experts recommended to simplify the administrative procedures, to reduce and adapt the requirements for participation and to raise the co-funding rates. The expert group recommended putting much more emphasis on wide dissemination of results and on better exchange and knowledge-sharing among the different categories of stakeholders. In particular, it underlined the need for interlinking applied research and end-users with a view to achieving problem-oriented solutions.

The expert group suggested broadening the programme's activities so as to cover GR relevant for biomass production, to improve knowledge on microbial genetic resources with particular focus on microorganisms' interactions with agriculturally relevant animal and plants, and to include freshwater and marine aquaculture. By establishing a framework in line with those recommendations, the EU can add value to the wide range of activities being taken to conserve traditional breeds and local varieties, at different geographical levels and in different natural and economic contexts.

Making GR conservation a success is of paramount importance as it provides a solid basis for greater sustainability and economic viability of agriculture, contributes to food security, ensures high food quality and more varied products, and achieves established biodiversity goals.

ANNEX

INDEPENDENT EXPERT EVALUATION OF COUNCIL REGULATION (EC) NO. 870/2004

CONSERVATION, CHARACTERISATION, COLLECTION AND UTILISATION OF GENETIC RESOURCES IN AGRICULTURE

PREPARED BY A GROUP OF INDEPENDENT EXPERTS

GEORGIOS BANOS (CHAIR)

LEEN DAVIDSE

ELISABETTA GIUFFRA

LUCYNA KĄTSKA-KSIĄŻKIEWICZ

GÉZA KOVÁCS

DIEGO RUBIALES OLMEDO

1ST JUNE 2012

Table of Contents

Chapter 1 - Abstract 8
Chapter 2 - Executive Summary 9
Chapter 3 – The background to this evaluation 12
Chapter 4 - The scope of the evaluation 14
Chapter 5 - The methodology of the evaluation 15
Chapter 6 - The consultation of stakeholders 17
Chapter 7 - The results of the evaluation 23
7.1 WHAT WAS DONE: ADMINISTRATIVE ASPECTS 23
7.2 WHAT WAS DONE: TECHNICAL ASPECTS 25
7.3 WHAT WAS DONE: OUTCOMES AND IMPACT 29
7.4 WHAT WAS DONE: WIDER CONTEXT 35
7.5 WHAT SHOULD BE DONE IN THE FUTURE 40
Chapter 8 - Conclusions and recommendations 49
Conclusions 49
Recommendations 49
Chapter 9 - Annexes 51
Annex 1: Documents provided by the Commission to the experts 51
Annex 2: A sample of actions co-funded by INTERREG. 52
Annex 3: Some projects on plant genetic resources co-funded by FP7 53
Annex 3b: Some activities on plant genetic resources in the COST programme 54
Annex 4: List of stakeholders receiving invitation to the questionnaire 54
List of member state countries invited to participate in stakeholders Questionnaire 54
List of stakeholders invited by the Commission 54
List of Stakeholders who requested to participate 54
List of the coordinators of 17 co-funded actions invited to participate in Stakeholders Questionnaire as well as in Coordinators Questionnaire 54
Annex 5: The Stakeholders questionnaire 54
Annex 5b: Specific Questions to Coordinators of the 17 funded actions of the Community Programme on Genetic Resources in Agriculture 54
Annex 6: Sample list of scientific publications from Actions co-funded under Council Regulation 870/200. 54
Annex 7: Examples highlighting a potentially unclear demarcation between this Community Programme and the Rural Development policy. 54
Annex 8: Acronyms, Abbreviations and Glossary 54
A - D 54
F - G 54
H - Q 54
R - Z 54
Glossary 54

CHAPTER 1 - ABSTRACT

This report presents an independent expert evaluation of the European Community Programme (Council Regulation 870/2004) on the conservation, collection, characterisation and utilisation of genetic resources in agriculture.

First, the scope and methods of evaluation are described. The material for the evaluation included data from the 17 individual Actions funded under this particular Programme, a special consultation with stakeholders, information on the preceding Council Regulation (EC) No. 1467/94, and documents provided by the Commission (e.g. Rural Development Programme) and other organisations (e.g. Convention on Biological Diversity and the Commission on Genetic Resources for Food and Agriculture of the United Nations Food and Agriculture Organisation, and the International Treaty on Plant Genetic Resources for Food and Agriculture). The criteria for the evaluations were effectiveness, efficiency, and relevance of the implementation of the Community programme, and coherence with other EU instruments.

The results of the evaluation are a set of several conclusions and recommendations: a new Programme is recommended whose aim should be to deliver the best possible utilisation of agricultural genetic resources in practice. End-users should be directly involved in the funded Actions together with applied research organisations. Actions should improve cooperation, reduce duplication of effort and deliver added value at EU level. Some new topics for work are identified

CHAPTER 2 - EXECUTIVE SUMMARY

This report presents an independent expert assessment of the key results and findings of Council Regulation (EC) 870/2004 leading to a number of recommendations. The legal basis of this evaluation is defined in Article 14 of this Regulation.

The evaluation focused on the effectiveness, efficiency and relevance of the implementation of the Community Programme, and its coherence with other related EU instruments. The following sources of information were taken into account:

1. The 17 individual Actions funded under Council Regulation (EC) No 870/2004: The effectiveness and efficiency of the Community Programme were assessed in a critical analysis of administrative and technical aspects of these Actions. Emphasis was placed on the extent to which the Actions contributed to meeting the Programme's objectives with regards to conservation, characterisation, collection and utilisation of genetic resources in agriculture. Outcomes and effects of these Actions were analysed offering an assessment of the relevance of implementing the Community Programme. Here the focus was on the impact of the Programme, as reflected in the individual Actions, on end-users and on the agricultural sector as a whole.
2. Consultation with stakeholders and coordinators of the funded Actions: The Commission services identified a list of target stakeholders, and formulated a questionnaire to canvass their views on the Community Programme. A second questionnaire was prepared for coordinators of the funded Actions. Responses to the questionnaires were summarised and used in the assessment of the Programme's effectiveness, efficiency, relevance and coherence with other instruments, and also identify and to help evaluate future needs.
3. Material provided by DG AGRI relevant to the implementation of the preceding Council Regulation (EC) No. 1467/94: This information contributed to the assessment of the overall effectiveness and relevance of the two Programmes on genetic resources in agriculture.
4. Relevant information provided by various Commission sources (Rural Development Programme, material from DGs RTD, SANCO and ENV), together with material from the Convention on Biological Diversity, from the Commission on Genetic Resources for Food and Agriculture of the United Nations Food and Agriculture Organisation and the International Treaty on Plant Genetic Resources for Food and Agriculture, which was useful in the assessment of the coherence of this Community Programme with other EU instruments.

Our independent analysis of all the material described above has led us to the following conclusions:

1. The Council Regulation (EC) 870/2004 "establishing a second Community Programme on the conservation, characterisation, collection and utilisation of genetic resources in and repealing Regulation (EC) No 1467/94" has:
    a. Stimulated considerable interest among various groups of stakeholders within the European Union and beyond.
    b. Promoted collaboration among diverse groups of stakeholders in different countries.
    c. Led to the establishment of useful links and partnerships across Europe.
    d. Advanced the understanding of some local practices and needs.

   e. Led to useful results and guidelines for the conservation of valuable genetic resources.
   f. Established well characterised and evaluated core collections and cryo-banks of various plant and animal species.
   g. Improved the scientific knowledge on the nature, management and potential of genetic resources of some species of farm animals, crops and forest trees in Europe.
2. Because of considerable emphasis on scientific activities relative to their implementation in practice, although the characterisation, collection and conservation aspects of agricultural genetic resources were effectively addressed for the species studied, the utilisation component of the Programme was not addressed to the same extent.
3. In some cases the structure of reimbursing costs made it difficult for certain organisations to participate.
4. In some cases, the project results, although potentially relevant, were not available to the end users.
5. A number of newly developed databases and established ones were used to accommodate the data generated but open access to these results was not always possible. Furthermore, no mechanism was put in place to facilitate accessibility to the results via a single European portal.
6. Long-term benefits of conservation may not be realised due to the high costs of relevant activities.

In view of the above conclusions, the following recommendations were made:

1. The EC Programme on agricultural genetic resources should continue, building on the successes of the two previous Programmes. Ways should be found to reduce the administrative burden on coordinators in order to improve the effectiveness of project execution and delivery of results.
2. A new Community Programme should require that the primary objective of selected Actions be the delivery of appropriate utilisation of agricultural genetic resources in practice. To attain this objective, an increased involvement of end-users and Small and Medium Enterprises in the funded Actions should be promoted, to ensure the immediate transfer and implementation of project results.
3. The new Community Programme must harness all recent scientific and technological developments, which can offer improvements in the speed and efficacy of characterisation of agriculturally relevant traits. The aim should be the practical application of recent scientific advances to the conservation and utilisation of genetic resources in agriculture. To this end, participation of applied research organisations in combination with the end-users mentioned above should be encouraged.
4. Another important emphasis of the new Community Programme should be on adding value at EU level through the harmonisation of efforts, policies and programmes on the conservation and utilisation of the agricultural genetic resources across all Member States.
5. Activities that promote the evaluation and exploitation of agriculturally important interactions between microbes and farm animals/crop plants that have been identified and characterised in previous research should be encouraged.
6. Another priority of the new Community Programme should be the conservation, characterisation and utilisation of genetic resources for fresh-water and marine aquaculture.
7. The new Community Programme should also focus on plant species for production of biomass and industrial products.

8. Options should be explored for better coordination of relevant EC programmes with the objectives of achieving economies of scale, avoiding overlaps, creating positive synergies and leading to outcomes for end-users.
9. Given the high costs of long-term conservation, a new Community Programme should support relevant activities that have the potential to eventually generate income for the end-users. The aim should be that the conservation and utilisation of these agricultural genetic resources become self-supporting.
10. Before the launch of any new programme, the Commission should organise a two-day meeting of stakeholders to discuss the modalities and to start build interest groups.

CHAPTER 3 – THE BACKGROUND TO THIS EVALUATION

In this chapter we briefly survey the background and relevant developments. Recently, the European Commission has launched a new European Innovation Partnerships (EIP) on Agricultural Sustainability and Productivity, which aims to provide a working interface between agriculture, bio-economy, science, and others at EU, national and regional level. It will also serve as a catalyst to enhance the effectiveness of innovation-related actions supported by Rural Development Policy as well as the Union Research and Innovation. In this context, the European Academies Science Advisory Council (EASAC) has emphasised "*that it is vital for policy-makers in the EU and at the Member States level to recognise the crucial contribution that plant genetic resources can make to tackling the EU societal challenges across a broad front and ensuring policies are in place to support their enhanced conservation and use*". A third recent development at EU level is the EU biodiversity strategy to 2020 which includes (Action 10) "The Commission and Member States will encourage the uptake of agri-environmental measures to support genetic diversity in agriculture and explore the scopes for developing a strategy for the conservation of genetic diversity".

In science, the years since the first EU Regulation on the conservation, characterisation, collection and utilisation of genetic resources in agriculture (Council regulation (EC) No 1467-94) have seen remarkable advances in research relevant to biodiversity and since the second (current) Regulation became operational in 2004 the pace of advance seems even to have accelerated. There are now new possibilities for the utilisation of genetic resources when these developments have been realised. For example, refined phenotype recording should enable new desirable traits related to 'robustness' (e.g. to climate change, pathogens etc) and improved welfare to be understood at a genetic and genomic level, and eventually to be transferred to practice. In agricultural crops, breeding efforts have led to increased productivity, largely due to the development of modern varieties that, although each is genetically uniform, taken together cover a considerable range of genetic variation.

Such considerations raise the need to harmonise collaborations and synergies of current and future Community Programmes on research, preservation and utilisation of genetic resources, so as to achieve economies of scale, avoid overlaps, create positive synergies and lead to outcomes that are useful in practice.

At the international level there have also been important developments since 1994 and the first Regulation. Among legislative developments particular to genetic resources covered by the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)[1] and also of collections from the international agricultural research centres (Art 15 of the ITPGRFA), is the new legal requirement for standard Material Transfer Agreement (MTA) to govern access to plant genetic resources and the fair and equitable sharing of the benefits arising out of the use of genetic resources on a world scale. In this global context, it should be noted that the coordinators and partners of the two Community Programmes have accumulated much experience of MTAs, ABS, etc., which can certainly contribute to the EU's participation in the implementation of the Treaty obligations.

We should also mention that there have been organisational developments over the same period. National structures of agricultural research have been rationalised, re-organised, privatised, or even done away with.

[1] The European Union is Member of the Treaty since 2004 (Council decision 2004/869/EC of 24/02/2004).

It is against this background that the Evaluation has taken place.

CHAPTER 4 - THE SCOPE OF THE EVALUATION

Council Regulation (EC) No 870/2004 (24 April 2004) establishing a second Community Programme on the conservation, characterisation, collection and utilisation of genetic resources in agriculture and repealing Regulation (EC) No 1467/94 lays down (Article 14) that, at the end of the programme, the Commission shall appoint a group of independent experts to report on the implementation of this regulation, to assess the results and to make appropriate recommendations. The group's report, together with the Commission's comments, shall be submitted to the European Parliament, the Council, and the European Economic and Social Committee.

The scope of this evaluation is the Community Programme on genetic resources in agriculture, in particular the implementation of Council Regulation (EC) No 870/2004, as well as the conclusions drawn from the implementation of the preceding Council Regulation (EC) No 1467/1994. It takes into account the 17 Actions co-funded under the Regulation, the annual and final reports of those Actions, and the expert evaluations of those reports. The scope also includes preparatory familiarization of the background context and major issues.

The evaluation is based on the following criteria: the effectiveness, efficiency, relevance of implementing the Community Programme, and its coherence with other related EU instruments.

CHAPTER 5 - THE METHODOLOGY OF THE EVALUATION

This chapter describes the approach and the methodology which were used in the evaluation of the Community Programme (Council Regulation (EC) No 870/2004) on genetic resources in agriculture. The evaluation focused on the effectiveness, efficiency, relevance of implementing the Community Programme, and the coherence with other related EU instruments, as discussed below.

A group of independent experts was appointed by the Commission to report on the implementation of Council Regulation (EC) No 870/2004, to assess the results of the Community Programme and to make appropriate recommendations. In order to achieve this, the independent experts had a first preparatory meeting in Brussels in November 2011 to agree on the structure and the road map for this evaluation. The experts had the opportunity to meet with relevant members of various DGs to gather information about their programmes, and with the inter-service Steering Group to comment on the programme. The draft evaluation started at that meeting, following a schema suggested by the Commission, and was continued remotely. After receiving feedback from the Commission's Steering Group, this first draft was revised during a second meeting of the experts in Brussels in April 2012.

The group of experts examined the final results of the 17 co-funded Actions under Council Regulation (EC) No 870/2004 with respect to the achievement of the objectives of the Community Programme. Information analysed included the initial Action description submitted; the recommendations of the evaluation panel and the ensuing technical reports (annual interim progress reports, final reports and assessment reports by independent experts). The analysis of administrative and technical aspects of what was done in each Action and the results obtained (Chapters 7.1, 7.2 and 7.3 of this report) allowed the assessment of the Programme's efficiency and effectiveness. Furthermore, outcomes and effects of the individual Actions were evaluated in order to assess the relevance of implementing the Community Programme (Chapter 7.3).

The group of experts also took into account the conclusions drawn from the implementation of the preceding Council Regulation (EC) No 1467/94. This information included the reports of other independent experts to the Commission, and of the Commission to the Council. This helped understanding what was done in the past, thus contributing to the assessment of the effectiveness and relevance of the current Community Programme.

In addition, the Commission services identified a list of target stakeholders and prepared an on-line questionnaire to canvass their views on the Community Programme. A second questionnaire was prepared for coordinators of the co-funded Actions. The experts were given the opportunity to comment on the content of both questionnaires. Responses to this questionnaire are summarised in

Chapter 6 and were used in the assessment of the Programme's effectiveness and efficiency (Chapters 7.1, 7.2 and 7.3), relevance (Chapter 7.3) and coherence with other instruments (Chapter 7.4), and also to identify and evaluate the relevance of future needs (Chapter 7.5).

The evaluation took also into consideration information from other EU instruments supporting the conservation of agricultural resources that were provided by various DGs (AGRI, ENV, RTD, and SANCO) and, as far as information was available, corresponding measures undertaken by Member States. The evaluation considered also the "Biodiversity Strategy", first adopted by the EU in 2001, and recently renewed towards 2020 (COM 2011 - 44 final) and "Plant genetic resources for food and agriculture: roles and research priorities in the European Union", (Policy report 17 of the European Academies Science Advisory Council (EASAC), December 2011). Furthermore, the evaluation considered material from the Convention on Biological Diversity (CBD) and the Commission on Genetic Resources for Food and Agriculture (CGRFA) of the UN-Food and Agriculture Organisation (FAO) including the International Treaty on Plant Genetic Resources for Food and Agriculture. This facilitated the overall assessment of the coherence of this Community Programme with other related instruments (Chapter 7.4).

All documents made available for this evaluation are listed in Annex 1 (Chapter 9).

CHAPTER 6 - THE CONSULTATION OF STAKEHOLDERS

Invitations to participate to the stakeholders' questionnaire were sent to 188 participants (see list in Annex 4 of Chapter 9). Replies were submitted by 43 respondents, of whom 2 were the same. Respondents were at liberty to leave an answer blank and some answers were disregarded as being outside the scope of the original question. We thank the respondents for their work and assure all of them that each response has retained our complete attention. Their input informed our views throughout the evaluation process.

As regards Q 1, the main benefits of conserving agricultural resources were thought to be environmental; agronomic and/or economic; food security; scientific interest; larger products ranges (diversification, products offer) and no regret strategy in case of future needs. Important meaning has got also Non-tangible benefits (cultural, ethical).

As regards Q 2, “Are you familiar with the Community Programme established by Council Regulation No. 870/2004” the majority of the respondents affirmed acquaintance of the Community Programme.

As regards Q 3, most of the respondents were actively, directly involved in conserving genetic resources and some of respondents were responsible for coordination and management of the Programmes at national level (Ministry etc.), i.e. indirect involvement. Only a few respondents did not affirm involvement.

Q 4 was 'The Community Programme had the objective "to help ensure and improve conservation, characterisation, collection and use of plant, animal & microbial genetic resources". To what extent has the objective been realised?' Most respondents positively evaluated the realisation of the objectives. Criticisms included the limited scope of the Programme and level of funding, also the problems of access to participation for farmers, small organisations and others with little experienced in applying for EU projects. A few respondents criticised the lack of work on conservation *in situ* (on farm/in garden), inadequate farmer information about the Programme, and lack of environmental policies.

Q 5, 6 and 7 concerned the other objectives of the Programme. The majority of respondents felt that the objective of coordinating and harmonising actions in Member States had been achieved but a sizeable minority thought that realisation of those objectives was limited or partial, and a few thought that the long term impact would be small. A little more than 1/3 of the responders thought that the objective (q6) of "promoting information exchange" had been achieved. The most frequent criticism was that information exchanges had been limited to the project partners, and/or scientists. Responses to Q7, regarding multidisciplinarity, tended to agree; about half the respondents criticised the lack of collaboration with NGOs, farmers and gardeners.

Q 8 gave stakeholders the opportunity to list the positive and negative effects to be expected from the Programme. The positive effects were thought to be an increased level of cooperation, coordination and sharing of information between participants etc. Among the negative aspects were listed e.g. the problem of continuing funding after the end of the Programme and also limited dissemination of results to the public, and the apparent dispersal of efforts at EU level, due to a perceived fragmentation of policy approaches between the various Directorates of the Commission.

Q 9 was a follow up to q 8, regarding the administration of the Programme, with recommendations for the future. Many stakeholders drew attention to the low funding rate by comparison with FP7 (which provides up to100% reimbursement of the costs of project management). There was also a general consensus that administrative bureaucracy should be significantly reduced in any future programme. Opinions on calls for proposals were mixed - some thought that there should be a call every 1 or 2 years, but others thought that one call every 4 years should be enough.

Q10 asked about Rural Development Programmes, and how they supported conservation measures in the respondents' country. Responders indicated that for the current funding period (2007-2013) the Council Regulation No. 1698/2005 on the "support for rural development by the European Agricultural Fund for Rural Development (EAFRD)" sets the general framework for the rural development policy. The implementation of the EAFRD at national level supports a sustainable rural development through a variety of agri-environmental-friendly measures, including the conservation and utilisation of genetic resources. However, national policy and support regarding levels of subsidies for the protection of plant and animal resources significantly differed between the respondents' countries.

The relationship between the EU's Programmes dealing with genetic resources under (i) Rural Development, (ii) Research, and (iii) the Community Programme, was explored in q 11. According to the responses it is clear that the same respondents may seek funding for their work under any or all of these three schemes. Some respondents drew attention to significant differences and complementarities between them, with the Research Programmes concentrating on research, which is specifically excluded from the Community Programme, and Rural Development reaching out to a wider range of stakeholders than the other two, and in particular giving support to those who care for rare breeds *in situ*. Some respondents pointed to overlapping aims and lack of adequate coordination between the three actions.

Q 12 asked stakeholders which sector could benefit in particular from efforts to conserve genetic resources in agriculture. There was a very substantial majority opinion that the main benefit was for Farmers, Breeders and Consumers. Other respondents indicated benefit for Agri-food industry and scientific bodies. Some of the replies mentioned "Other"; notably the human health, cosmetics, and bio-energy sectors.

Q 13 asked about the existing initiatives and activities of EU and other organisations. The sectors that could benefit from efforts to conserve genetic resources in agriculture are mentioned as follows: EU Community Programme (Council Regulation No 870/2004) was chosen by most respondents, followed by EU Rural Development Policy; European Cooperative Programme for Plant Genetic Resources (ECPGR) and International Treaty on Plant Genetic resources for Food and Agriculture; EU Research Framework Programmes; European Regional Focal Point for Animal Genetic Resources (ERFP). There was also mention of activities of the UN-Food and Agriculture Organisation (FAO) and Convention on Biological Diversity (CBD), including the Nagoya protocol.

Twenty-six respondents answered Q 14 regarding the impact of the EU seed and propagating material and zootechnical legislation on actions relevant for the conservation of genetic resources diversity (GRD). While two stakeholders affirmed that the legislation has a positive impact on GRD, 13 clearly affirmed the opposite. The remaining 11 gave their general views but this did not allow choosing for a clear (positive/negative) opinion. One of the stakeholders responded *"the directives on conservation varieties are an important step forward because they implicitly acknowledge that seed regulations since the 1960s have contributed to the genetic erosion of agricultural diversity and so must be amended somehow."*

Q 15 asked for opinions as to how actors at all levels could be encouraged to engage in the conservation of agricultural genetic resources. The few responses to this question included the following:

1. Local action: to promote niche marketing of local products, afford legal protection to *in situ* conservation of wild crop relatives, allow the production and sale of varieties not on the Common catalogue.
2. Regional action: to support projects which aim to market genetic diversity.
3. National action: establishment of national programmes on genetic resources conservation.
4. The European Union action: support specific activities at European level including the participation of non-member states.

Q 16 asked: "*With respect to decisions on different types of measures and their implementation, which role should be attributed to the local, regional, and national level? Which decisions and which types of action should be undertaken specifically at the EU level?*" Twenty-eight stakeholders answered to q16, but only few of them clearly indicated the distinction between levels (local/regional/national/EU). It was thought that one of the most important tasks at local level is to identify local varieties and breeds to be conserved, to identify and train local farmers to conserve material on-farm, and to encourage support networks so as to maintain GR in use and to record traditional knowledge. At regional level the most important task was thought to be adapted to EU guidelines in a coherent way with the national laws. Other respondents mentioned the networking of local actors, organising knowledge transfer, and stimulate (including financing) *in situ* and *ex situ* conservation. At national level respondents indicated a need to integrate the ITPGRFA (especially art.

5, 6 & 9), into national legislation. Respondents also mentioned the need to maintain inventories at national level, to coordinate research and conservation activities across national borders, in cooperation with the national and international genebanks. At EU level, respondents suggested a unification of the overall framework for conservation activities, integrated into the CAP, with continuous funding for *in situ* and *ex situ* conservation work.

Q 17 asked about the match between actual needs, and the stated objectives of Council Regulation (EC) No 870/2004. Out of the 35 respondents, the majority replied that that the Programme is completely relevant to the needs. A few respondents added that the Programme is mainly oriented to *ex situ* conservation and more *in situ* dynamic management would be desirable. Some respondents suggested the initiation of priority-based funding. Other respondents suggested that the Programme relevance belongs to the category of "enough", and the comments are similar as in the previous question, saying that the next programme has to be more oriented to *in situ* conservation and on farm management of GR.

Then come several questions which invited the respondent to put a list of items in rank order. Q 18 asked about the use of resources. The majority of options chosen by respondents indicated "Conservation" and "Characterisation" followed by "Use" and "Evaluation", followed by "Collection" and "Collection maintenance and updating". Interestingly, development of genetic diversity (level of population) got the lowest ranking.

Q 19 asked about the type of conservation actions to be promoted. Taken all replies, animals and plants together, the overall majority opinion was that *in situ* and *ex situ* actions are of equal importance followed by "*in situ* more important than *ex situ*".

Thirty-two responses were received to the Q 20 about the "utility of EU lists". According to the majority of respondents EU-wide lists of endangered breeds and plant varieties would be useful for the implementation of a possible future EU-Community programme. Only one response recognised these lists as a good starting point, and few respondents mentioned that, although it is a good starting point, its applicability would be fairly limited. A few stakeholders mentioned that the development of these lists should be a national responsibility; and a few respondents suggested that the lists are not useful.

Q 21 asked stakeholders to put a given list of actions for *in situ* conservation in rank order. 36 respondents chose at least 1 option. The majority of respondents indicated 'Knowledge transfer' followed by 'Networking'.

Q 22 asked stakeholders to put a given list of actions for *ex situ* conservation in rank order. Thirty-seven respondents chose at least one option. "Maintaining databases" and "Developing databases" were the two majority opinions and networking was also indicated as a very important task. Although

"Funding" is not considered as an 'action' but as an 'instrument' it was indicated by several stakeholders. "Centralisation of database and collection" was ranked last.

Q 23 asked for the stakeholder's view regarding the obstacles to valorising under-utilised and traditional varieties and breeds. According to the stakeholders' responses this is one of the most important questions for sustainable agriculture and the use of genetic resources. To overcome the obstacles, Europe wide communication is needed, including political effort, financial managements systems, legislative processes, and closer interaction between all stakeholders in the agricultural sector starting from research till the consumers. To overcome the existing obstacles, problems have to be solved not only in the genetic resources community itself, because many basic societal questions have to be taken into account. It would be very important to study these questions in more details by using one of the EU funded research instruments. A few stakeholders replied that under-utilised and traditional varieties and breeds tend to be of limited economical value. Other stakeholders blamed legislation systems, industry and market standards, global market chains, the dominance of *ex situ* conservation over *in situ* dynamic management etc. as obstacles.

Question 24 was about invertebrates and micro-organisms; it invited stakeholders to put a list of priority areas in rank order. Twenty two respondents chose at least one option. The top rated priority was "Soil biodiversity", second was "Plant & animal health microorganisms", followed by "Agro-industry", "Biocontrol" and "Pest and diseases". "Pollinators" were also mentioned. Two respondents added the category of ruminant protozoa. All answers indicated the need for a systemic, rather than fragmented, approach.

Q 25 asked about the link between securing product quality and quantity and the conservation and sustainable use of genetic resources. Respondents though that holders of genetic resources should do more detailed assessment of quality and production characters, that all such analyses should be done in close collaboration with end-users (e.g. breeders) and that the resulting data, together with the genetic materials, should be easily available. It was also thought that evaluation the assessment exercise should include the archiving of associated traditional knowledge. Collaboration between the various actors (farmers, foresters and gardeners, breeders, researchers, retailers and consumers) was seen as important to maximise opportunities, resources and efforts and to interchange knowledge.

Thirty responses were received for Q 26 on short food supply chains. Most respondents agreed that short supply chains can promote the use of traditional varieties, with benefits for rural development. There was also a number of calls for improvements in specific labelling schemes, such as the EU-label "Protected Designation of Origin" and "Protected Geographical Indication" with the suggestion of a new EU label" traditional and local agricultural or under-utilised genetic resources" so that dynamic conservation and production lead to marketable products.

As regards "Other comments & suggestions" (Q27), 13 stakeholders made some comments or suggestions. The major concern was the need for more and sufficient funding for GR conservation and use, with several respondents mentioning the needs of small farms. Several respondents mentioned the need of a new, or the extension of recent Community Programme on genetic resources to the fields of various untapped subjects such as aquaculture and industry (non-food), and energy crops.

CHAPTER 7 - THE RESULTS OF THE EVALUATION

7.1 WHAT WAS DONE: ADMINISTRATIVE ASPECTS

4.1.1. a) Action selection process: how was the funding selection process and subsequent monitoring conducted?

Calls for Proposals were published in the Official Journal of the European Union on 26/7/2005 (closing date 30/9/2005) and on 28/4/2006 (closing date 30/6/2006). A total of 72 proposals were submitted in response to the two Calls. There were 60 proposals for Targeted Actions, seven for Concerted Actions, and four for Accompanying Actions. Following examination by the Commission services, seven proposals were deemed ineligible under the published Tender Specifications. The 65 eligible proposals were evaluated by teams of independent experts, who established final lists of proposals in ranked order on the basis of the Tender Specifications. The top proposals were selected for funding - a total of 17 proposals across the two Calls – based on: (1) Relevance of the action to the objectives of the Community Programme; (2) Technical quality of the proposed work; (3) Quality of the management of the action; (4) European added value and potential impact of the action; (5) Quality of the coordination between the proposer and the partners; (6) Mobilisation of resources for the action. Further details for each funded Action are summarised in Table 1.

Four of the 65 eligible proposals dealt with micro-organisms, 20 proposed work on animals, 38 on plants (including forest trees) and three proposed joint work on plants and on animals. No proposals for work on micro-organisms achieved the necessary level of excellence and neither did any of those on animals-plus-plants. The 17 selected proposals comprised five dealing with animal species and 12 with plants (crops or forest trees).

Each short list of selected proposals was submitted to the Programme Management Committee which delivered its opinion on the draft. The Commission services then established contracts with each of the selected proposers. The contracts were based on the wording of the proposal as submitted.

Although the evaluation reports of the individual proposed Actions by independent experts suggested to "improve the plan for dissemination" or "simplify and downsize the molecular section", we understand that there was no formal process for such remarks to be included in the final contracts.

The total estimated cost of the selected "animal" Action was 3,769,368 euros; the 50% EU contribution was 1,946,478 euros. In individual Actions, contributions ranged from 382,375 to 460,098 euros. The total estimated cost of the selected "plant" Actions was 15,077,987.2 euros and the EU contribution was 6,971,239 euros, with a range between 329,507 and 929,507 euros per project. The total EU contribution to the 17 Actions was 8,917,717 euros.

Once the Actions had started, coordinators were required to submit annual progress reports, plus a financial statement of accounts, to the Commission. At the end of the Action the coordinator submitted a final technical report covering the whole period. All reports were reviewed by external independent experts using the following rating scheme for each aspect of the work, and overall: Share of total score 81% to 100%=A, 66% to 80% = B; 51% to 65% = C; 26% to 50% = D; 0% to 25% = E. Activities and results in the top quintile (group "A") were awarded the mark Excellent and so on through Good, Satisfactory, Poor, down to Unacceptable for anything in the bottom quartile, (group "E"). The Commission prepared a summary of the evaluator's marks and accompanying text, derived some management instructions, and sent summary plus instructions to the coordinator for action. On many occasions a long sequence of exchanges ensued, placing considerable administrative burden on the coordinators of funded Actions.

In conclusion, the call stimulated considerable interest among stakeholders, attesting to the effectiveness of the Call. However, the subsequent administrative procedures were at times burdensome and complex. The latter was also expressed by stakeholders in their response to at least 3 questions (Q 4, 9 and 12). We conclude that major steps towards simplification are needed. In this context we draw attention to the simplification procedures that have been put in place for the new Horizon 2020 Programme. *"Horizon 2020 must attract the most excellent researchers and innovative enterprises. This requires further simplification of rules and procedures for participants. The FP7 interim evaluation report concluded that major steps towards further simplification were needed, through an approach based on an adequate balance between risk taking and trust in participants*".

4.1.2. b) Types of actions: targeted, concerted, accompanying; are they balanced?

The 17 selected and funded proposals comprised 15 Targeted Actions (12 on plants, three on animals), one Concerted Action and one Accompanying Action, both on animals. The balance was heavily tilted towards Targeted Actions.

Given the relative success of the Concerted and the Accompanying Actions (both received high marks in the independent evaluation of their final reports) it might be argued that more of such measures should have been funded. This observation is in line with a recommendation from the expert group that evaluated the 1st Community Programme (Council Regulation No. 1467/1994). However, the success of the Concerted and Accompanying Actions became apparent only at the end of the Programme. Furthermore, the original selection process was strictly based on the merit of each proposal as determined by the independent experts.

4.1.3. c) Type of beneficiaries: who are the most represented and those not represented?

Across the 17 Actions selected for funding, the five animal actions had a total of 45 partners from different institutions, and the twelve plant actions 133. Some institutions featured in more than one

Action. Partners were drawn from all but four of the current 27 Member States of the EU. The large majority (nearly 80%) were professional scientists from national genebanks or research institutes or universities. Other beneficiaries included breed associations and societies, and governmental and non-governmental organisations.

The relatively low level of participation of potential end-users of genetic resources (e.g. farmers, breeders, producers, growers, foresters etc) is troubling. The high representation of scientific participants (universities and research institutes) is probably due to the fact that such organisations have appropriate built-in infrastructures to promptly respond to Calls for proposals. Although involvement of these organisations ensures the important scientific dimension to the conservation, collection and characterisation of genetic resources, lack of end-users compromises their potential utilisation for the benefits to agriculture.

In conclusion, lack of balance between scientific partners and end-users adversely affected the achievement of the main objective of this Community Programme to "*provide an efficient and practical support to the actual and future end-users of genetic resources*" thereby compromising the effectiveness and relevance of the Programme.

7.2 WHAT WAS DONE: TECHNICAL ASPECTS

Table 1 (pages 30-33 of this document) provides a summary of the 17 Actions and the technical achievements of each action in conserving, characterising, collecting, and utilising genetic resources.

We have evaluated the extent to which the Actions, taken as a whole, have contributed to the effectiveness and the efficiency of the Community Programme and the achievement of its overall objectives.

Reference to Table 1 shows that a number of significant contributions to meeting the Community Programme's objectives were indeed made.

However, although individual Actions met their contractual obligations as laid out in their Grant Agreement, we have identified some areas of shortfall in the selection of Actions with regards to the achievement of the objectives of the Community Programme and Regulation. One such area is an overall bias across almost all Actions towards academic/scientific activities, and little emphasis on practical applications and involvement of direct end-users. This focus extended to the dissemination and exploitation activities. In this respect, the panels who evaluated the original proposals had already noted that the dissemination and exploitation plans of some Actions were focussed more towards the scientific community than to farmers and growers, and had asked for clearer utilisation plans for end-users. However, no action seems to have been taken to implement the panels' recommendations (some of the evaluation forms asked for "Recommendations for the preparation of the grant agreement") because the formal position of the Commission was not to change offers in order not to compromise the equal treatment of applicants in the selection process.

Since the Detailed Implementation Plan of each Action remained as originally proposed, our observations should not be considered as implying weaknesses or failures of any particular Action. Rather, they point to formal limitations that prevent the Commission from acting upon the recommendations of the proposal evaluation panels.

We have also identified other generic issues that affected the implementation of the Programme: notably, several Actions experienced administrative problems and delays. These were due to managerial failures in foreseeing or resolving financial, personnel, etc issues.

Further evaluation of these aspects relevant to the effectiveness and efficiency of the Programme follows.

4.1.4. d) In situ / ex situ *conservation: are they balanced?*

There was a good balance between ex-situ and in-situ conservation of animal genetic resources, especially in the 3 Targeted Actions. Actions 012 - EUREKA and 020 – EFABIS developed guidelines and strategies for both cryopreservation *ex situ* and conservation *in situ*. The Action 040 - HERITAGESHEEP had an excellent balance focusing on specific in situ problems facing localised breeds, as well as strategies for their *ex situ* conservation.

Among the plant projects, Action 063 - CYNARES characterised several on farm collections. Action 057 - AEGRO identified areas for *in situ* conservation of wild relatives of *Allium*, *Avena*, *Brassica*, and *Prunus*; however, as they explained "*the partners come from public research institutions which are responsible for research. The establishment of genetic reserves is clearly beyond the formal responsibility of public research institutions*"; therefore, the *in situ* conservation guidelines still remain to be put into practice, although such implementation was not a contractual objective of the Action.

There were several more *in situ* conservation projects, notably among the Actions on woody species (for example 008 - GRAPEGEN, 068 - SAFENUT, and 009 – EUFGIS).

The majority of plant Actions focused on *ex situ* conservation, ranging from DNA banks, to cryopreservation of vegetative tissue or of pollen, to storage of seeds and field collections. In our view, such systems are a better use of EU funds than trying to maintain the same material as living plants *in situ*.

Most of the Actions concerned existing collections. Amongst the "animal" Actions only 040 - HERITAGESHEEP had any activity on new collections (cryo-bank of 15 breeds of sheep in 5 Member States). All of the "animal" Targeted Actions worked on the characterisation and evaluation of existing collections of genetic resources.

Some of the "plant" Actions achieved substantial numbers of accessions characterised (including use of molecular markers and phenotyping) e.g. 008 - GRAPEGEN (4,000 accessions characterised) and 009 - EUFGIS (3,000 accessions); for further details on all Actions see Table 1.

4.1.5. e) Number of genebanks and databases completed and created?

Genebanks were established in the 040 - HERITAGESHEEP Action (a new cryo-bank of material from local breeds of sheep), 056 - EURALLIVEG and 071 - RIBESCO (cryo-banks of pollen and dormant buds), and 049 - EURIGEN and 063 - CYNARES (DNA banks).

All the Targeted Actions used some sort of database which they made available to partners and then to visitors over the web. Two web applications for collecting and managing genebank data were also developed.

As regards coverage of the databases, notable examples among the "animal" Actions include 020 - EFABIS (nine Member States now implementing national genebank guidelines established by the project), 040 - HERITAGESHEEP (on-line database describing 49 breeds from five Member States) and 066 - ELBARN (a large database covering a total of 43 European countries). Databases were also developed by Actions on the genomic aspects of genetic resources; amongst the animal Actions, the 067 - GLOBALDIV database of information on breeds with specific extreme genotypes is particularly worthy of comment. The animal actions also established two networks linking local databases, and breed preservation and rescue centres across Europe.

As regards the "plants" Actions, some Actions contributed or will contribute to existing European databases (008 - GRAPEGEN to the ECPGR European *Vitis* database; 061 - AVEQ to the European Avena database, originally established with the support of Council Regulation (EC) 1467/94) but it appeared that scientists in many Actions developed their own individual database for their own particular needs with the ambition of integrating it later; as one of them wrote "*A project database will be created as a project management tool and as a data repository under development. After consolidation of the database concepts ways will be sought to integrate the results collected in the project into already existing data repositories as outlined below.*" and *"It is not intended to leave the project database as a new fragment in the puzzling landscape of biodiversity informatics. Rather the results should be integrated in already existing and well established information systems (ECCDBs, CWRIS, EUNIS, GBIF)".* As the final report of the 071-RIBESCO action put it "*At this state, the RIBESCO action cannot deliver its data to EURISCO database, as proposed by the evaluator of the 3rd Annual Interim Technical Report of RIBESCO. This is because the EURISCO Web Catalogue currently contains passport data only*". This may have deprived the users of the database from potential benefits such as uninhibited information exchange and retrieval, and ease of meta-analyses. Again, this is not meant as a criticism of the individual action, where the grant agreement obligations were met, but it points to the failure to recognise the possibility before the grant agreement was drawn.

There were some notable advances in individual database content and presentation. However, database development in most Actions relied on the availability of additional funding sources. Budget limitations and unanticipated technical problems may have limited optimal development as has been indicated by the coordinator of the action 061 – AVEQ: *"Software development normally by far exceeds the budgets available in genetic resources projects. Achievements in this field, if any, are mainly by self exploitation of enthusiastic workers".*

In most cases, the databases were available to the public and end-users under open-access terms. A few databases, however, required user registration or communication with the coordinator of the Action, thereby prohibiting immediate access to the results and diminishing the value of the outcomes.

In sharp distinction to the USA, where the USDA has maintained the Germplasm Resources Information Network (GRIN) for many years (website: http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl), Europe has no single centralised database for genetic resources of agricultural crops or forest trees. Under FP5, a Europe-wide database (EURISCO) was developed. Regulation 870/2004 foresaw the *"establishment, maintenance and improvement of web-based European Central Crop Databases (ECCDBs) with characterisation and evaluation data and linked to the network of national inventories and to the EURISCO catalogue for the passport level data"* which, however, has not been achieved.

As to the future, we wish to echo comments made by some coordinators in the stakeholder survey: *"Creating a database of living (in situ) resources is one thing, keeping it up to date is quite another. This requires a perpetual commitment to remaking the database at least once every breeding season."* Similar attention is required for the maintenance of *in situ* collections and of *ex situ* cryo-banks, for either animals or plants. We return to this question later.

In conclusion, several useful databases were developed to accommodate data generated in these Actions, which contribute to the effectiveness and efficiency of the Community Programme. However, in some cases, accessibility to the full content of the databases by end-users was not straightforward. Furthermore, individual databases were constructed without reference to one-another and there is no single portal by which access to all these results can be gained.

4.1.6. f) Dissemination and exploitation of final results: to which audience?

Most (about 60%) Actions did an excellent job of disseminating their results in many European languages to a wide range of stakeholder groups across the EU, including scientific, industry and farm backgrounds and interests. Dissemination vehicles included not only partners' websites, but also newsletters, questionnaires, training days and workshops for stakeholders, as well as refereed publications and presentations to scientific meetings. Some of the "plant" Actions produced printed material such as booklets or variety identification cards for growers; Action 008 - GRAPEGEN organised a wine tasting for growers.

There was, however, a significant minority of Actions (we put it at 40% of the total) which concentrated almost exclusively on disseminating results among the academic community. They did little or no dissemination to key stakeholders such as breed societies, other end-users of genetic resources, and also the European citizens. Even though the Regulation lays down (Annex 1 Article 3.1) that "*The actions should add value (spreading knowledge, increasing use, improving methodologies, exchange between Member States)*", in practice little was done by some of the actions on either spreading knowledge or increasing use. Although these actions might have individually met their contractual obligations as per the respective grant agreements, they could not contribute to the Community Programme's requirement for wide distribution of knowledge and results emanating from the funded Actions.

Almost half of the "animal" Actions laid plans for the exploitation of their results at policy level (sustainable agricultural practices, conservation of biodiversity, other initiatives at regional and government level). Some plant Actions (e.g. 001 – LEAFYVEG, 049 - EURIGEN, 071 - RIBESCO) included partners who are active in plant breeding providing an opportunity to apply the results in future breeding of commercial varieties with increased agricultural performance and/or product quality.

In conclusion, dissemination and exploitation of final results generally received adequate attention by the funded Actions, and high marks were awarded to most final reports by independent experts. This contributes to the effectiveness, efficiency and relevance of the Community Programme. However, although the audience and final recipients of these dissemination activities always included scientific targets, other end-users were not always reached. This may be due to the fact that scientific organisations featured more often in the winning consortia than end-users. Furthermore, as mentioned in the previous section, there is not always open access to some of the results. This limits the added-value of the Programme with regards to "spreading knowledge, increasing use, improving methodologies".

7.3 WHAT WAS DONE: OUTCOMES AND IMPACT

4.1.7. g) Added value of the 17 co-funded Actions at EU level?

Added value can found in the following outcomes of individual funded Actions:

- Increased scientific knowledge of biodiversity in existing European collections at phenotypic and genomic level.
- Development of reliable *ex situ/ in situ* conservation techniques and establishment of reference frameworks for future management of *in situ* and *ex situ* diversity at EU and also national (Member States) level.
- Development and establishment of searchable databases and genebanks for future use, facilitating access to accessions with useful characteristics.
- Building links and collaboration across Europe between partners and beneficiaries.

- Generation of increased knowledge and awareness across Europe in the areas of agricultural biodiversity and sustainability, and food security issues.
- Availability of some well characterised and evaluated crop accessions to end-users.
- Availability of some virus-free accessions of some vegetatively propagated crops
- Opportunities for breeders and breeding companies to undertake innovative marker-assisted selection to develop competitive varieties/stock.

To further elaborate, we find it useful to distinguish "soft" results (increased knowledge and awareness at EU level, links and collaborations between partners) and "hard" results (tangible outputs such as genebanks, databases, reference frameworks for management of genetic resources *ex situ* or *in situ*).

For example, the 012 - EURECA Action had significant "soft" results; the 020 - EFABIS Action provided significant "hard" results - a formal framework of reference for managing animal biodiversity. Some projects (e.g. 040 - HERITAGESHEEP) had notable results of both "soft" (e.g. raised awareness among decision makers) and "hard" (e.g. cryo-preserved germplasm) nature. All these results have general applicability across the EU. Thus the added value of these projects at EU level is considerable.

Among the plant Actions, improved collections of vegetatively propagated species (garlic, artichokes, strawberry, raspberry, Ribes species) should have particular added value, since they make available material that has been well-characterised and which is virus-free.

"Soft" results include transfer of information to breeders and breeding companies on, for example, innovative marker-assisted selection techniques. We should also mention the sustained collaboration of partners and initiatives to develop new projects for EU funding (e.g. Actions 036 - GENBERRY and 071 - RIBESCO, and 057 - AEGRO contributed to the new EU FP7 research projects EUBERRY and PGR Secure, respectively). Such collaborative opportunities enable the undertaking of actions that individual organisations might not be able to undertake alone. Additional "soft" benefits include access to each other's infrastructure, exchange of ideas, practices, knowledge and resources, and a greater possibility for public outreach.

4.1.8. h) To what extent are the added value results of the actions likely to last after the termination of the projects?

"Soft" results (e.g. knowledge) will persist long after the end of the individual Actions and should make a significant contribution to the implementation of the Global Plans of Action on Animal Genetic[1] Resources and Plant Genetic Resources[2] in Europe. There will also be significant benefits

[1] Global plant of action (GPA) for Animal genetic resources: the first GPA was adopted by the first International technical Conference on AnGRFA in Interlaken in September 2007

[2] Global plan of action (GPA) for the conservation and sustainable utilization of plant genetic resources for food and agriculture: the second GPA was adopted by the FAO Council in Rome in November 2011.

from the links that have been built and the collaboration that has been established between partners, stakeholders and national authorities.

The lasting survival of the tangible or "Hard" results of each project is more difficult to predict; for example, a bank of preserved genetic material or a computer database needs continuous and costly maintenance. Furthermore, for some notable outcomes (e.g. the EFABIS database and RIBESCO collections) long-term survival will depend on future specific circumstances in the implementing organisation and may likely require funds from external sources. For example, the final report of 020 - EFABIS (page 60) stated that "*The long-term maintenance and further development of the network of information systems has been intensively discussed by the three parties involved (EAAP, FAO and European Regional Focal Point (ERFP) represented by a secretary elected every 4 years) leading to a draft Memorandum of Understanding (MoU). In the final stages of discussion, a new secretary of the ERFP was elected in August 2010. Discussions on some issues recommenced. The MoU is in the process of being signed by the three parties."* The final report of the 071 - RIBESCO Action summarises the probable sources of support of virus eradication and core collection preservation after March 2011; (RIBESCO final report page 38). There were various different solutions - some partners had been promised national funding for the next few (one to three) years; some were relying on own resources; one commented *"It is considered essential that resources are allocated to this kind of work either from the national government or at the EU level, because large activities in conserving plant genetic resources are not possible for universities and research institutes in their present funding situation.*" On the other hand, we note that some established organisations such as EUFORGEN are likely to take over maintenance of the database established by Action 009 – EUFGIS.

In conclusion, high costs and funding uncertainties of conservation and utilisation of genetic resources in agriculture will influence the duration of added value accrued from the various Actions. We therefore cannot predict with any certainty to what extent results (both "soft" and "hard") will find implementation by end-user for exploitation on the farm and increased sustainability of agriculture and food security.

4.1.9. i) Do we address the most important problems for the collection, characterisation, conservation and utilisation of agricultural genetic resources?

All 17 funded Actions addressed the issues of characterisation, collection and conservation in their subject species. Utilisation was addressed in some but not all Actions, the likely reasons being an under-representation of potential end-users in the consortia, a lack of insistence on utilisation in the Call and selection process, and, possibly, financial issues (e.g. limited funding, cost of preservation representing a small proportion of the total financial support of the agricultural sector etc).

In work on genetic resources, collection and conservation chronologically precede characterisation and utilisation. The 040 - HERITAGESHEEP Action is an outstanding example of a project that

successfully collected and conserved a localised resource that found itself under a very real threat i.e. the threat of wipe-out by compulsory slaughter.

Many other breeds and animal species could also profit from a similar approach, but it seems unlikely that they would attract enthusiasts with the same combination of competence and commitment. Conservation-through-utilisation would seem to be the ideal, but this raises financial issues which the Programme was never intended to address. However, if synergies could be developed with other instruments such as the Rural Development Programme, they would help remedy this problem. More on potential complementarities between instruments are discussed in a following section.

The problems facing plant genetic resources are more urgent for vegetatively propagated species (which are expensive to maintain) than for species which can be easily and cheaply maintained as seeds. For vegetatively propagated species, Actions 036 – GENBERRY, 050 - EURALLIVEG, 071 - RIBESCO and 063 - CYNARES have collected, rendered virus-free and conserved material which might have been lost to disease or lack of interest.

Europe has, or used to have, many landraces of cereals and vegetables. Those that still exist on farms are under considerable threat. In the current programme, two Actions worked in this area (061 - AVEQ and 057 - AEGRO). The first of these Actions evaluated a number of landraces of Avena. The second Action developed *in situ* management workplans for landraces of *Avena*, *Beta*, *Brassica* and *Prunus*.

As regards wild relatives of crops native to Europe the genera, i.e. *Avena*, were studied in 061 – AVEQ, *Avena*, *Beta* and *Brassica* by Action 057 – AEGRO and *Vitis* by 008 – GRAPEGEN, but the potential importance of this material for use in agriculture has not been quantified.

Furthermore, as already noted in a previous section, Europe still lacks a permanent and well coordinated single portal to the various databases on agricultural genetic resources.

Finally, given the current systems of scientific career management, there is a risk that project partners will pay too much attention to "innovations" (which result in scientific papers and hence career advancement) and not enough attention to repetitive tasks required for resource utilisation and product development.

In conclusion, the most important issues for the characterisation, collection and conservation of agricultural genetic resources were effectively addressed for the species studied, thereby achieving some of the relevant objectives of this Community Programme. On the other hand, utilisation, although intended, was not always addressed properly.

4.1.10. j) Which important species and varieties are missed out?

Although proposals on genetic resources of microbes were submitted, none was considered to be of sufficient quality by the evaluation panels.

There have been no "animal" Actions funded by the two Community Programmes on chickens, and among minor species, no projects on horses or other equidae, or water buffalo; and only one on rabbits. This is likely due to the fact that stakeholders involved with “mainstream” mammalian species (cattle, sheep, goats, swine) are more organised and prepared to respond to Calls for proposals.

In this context, it should be noted that aquaculture is the world's fastest-growing source of animal protein. Nearly half of all fish consumed globally are farmed. This issue was also raised in stakeholder response to the questionnaire. Aquaculture species did not feature in this Community Programme.

As to crop plants and trees, the second Community Programme included work on garlic and related *Allium* species, artichokes (*Cynara*), oats (*Avena*), wild relatives of oats, *Prunus*, currants and gooseberry (*Ribes*), forest (some forest trees), grapevine, leafy vegetables, nuts and almonds, rice, saffron, strawberries and raspberries.

Missing from the two Community Programmes were, notably wheat, rye, triticale, forage crops (grasses, legumes), grain legumes, oil crops (sunflower), fibre crops (flax, hemp), sweet and hot pepper, cucurbits (except melon), tomato, umbelliferous crops (except carrot), ornamental crops (except roses), medicinal and aromatic plants, and bio-energy and industrial crops.

4.1.11. k) Are the needs of agriculture addressed?

As regards animals, the needs of agriculture for genetic resources primarily concern the contribution of local breeds to the rural economy. Food quality issues of animal products were also addressed in some of the funded Actions. Network activities enabled exchange of practices that can be useful in the management of animal genetic resources, especially in cases of geographically isolated endangered breeds. It should be stressed that the survival of these breeds often depends on their increased competitiveness in niche markets for special, high-quality products (e.g. ‘Appellation d' Origine’)

As regards plants, the main reason why some crop varieties become "rare" is that they are less productive (less responsive to high inputs) than others. In low-input conditions, the situation is often

reversed - the rustic varieties perform better than the others; therefore, they play an important role in organic agriculture.

As also regards plants, the value of Actions in which characterisation and evaluation of agronomic traits such as resistance to abiotic and biotic stress was a major topic is evident. The same holds true for Actions that measured the evaluation of product quality. Action 009 – EUFGIS prompted national agencies and other relevant stakeholders in many countries to improve the management and documentation of their forest genetic resources. In Actions primarily dealing with conservation, the value for agriculture other than presence of the material in genebanks, could have been better demonstrated.

It seems likely that in the near future, there will be shortages of water for irrigation and of fertilisers. The search in properly characterised European collections of crop germplasm for genotypes that are able to resist such conditions should be encouraged. This would require accurate phenotyping of relevant traits and advances in genomic selection.

In conclusion, the Programme laid the foundation for genetic resources to contribute to meeting the needs of agriculture for sustainability and profitability. More emphasis on the possible utilisation of the genetic resources would have provided the framework for additional benefits at the end-users level, thereby enhancing the relevance of implementing this Community Programme.

4.1.12. l) Potential impact on breeders and end users (farmers, etc.)?

Regarding animal genetic resources, guidelines developed and strategies proposed in the funded Actions can help end users plan future *in situ* and *ex situ* activities. New entrepreneurs wishing to enter the area of low-input and/or alternative livestock farming may also benefit from information from Actions on well-adapted genotypes. Policies at national, EU and international (e.g. FAO) level would largely determine the future impact of these results. Access to the existing databases and information will be affected by such policies. Furthermore, animal conservation is an ongoing process and it is necessary to continue supporting endangered breeds. It could be expected that conservation programmes would be supported by national and Community authorities in various forms including the financial contributions to non-production functions of local breeds and specific policy measures contributing to the sustainable use of underutilised farm animal genetic resources.

As regards the plant Actions there was not always enough emphasis on providing information to end-users; for example to those looking for specific traits, such as product quality or stress resistance. In some actions there was too much investment in the newest state-of-the-art molecular approaches (sometimes even not fully validated in the given species) and not nearly enough on the distribution of information to users, via for example user friendly, easily accessible databases. As mentioned before,

end-users were under-represented in the project teams and among recipients of project results; this has compromised the potential impact and relevance of this Community Programme.

7.4 WHAT WAS DONE: WIDER CONTEXT

4.1.13. m) Complementarities/duplication between the projects co-funded by the Community Programmes, the Research Framework Programmes and other EU programmes including INTERREG

Council Regulation 870/2004 established the second Community Programme on genetic resources in agriculture, following up on the completion of Council Regulation (EC) 1467/1974 that established the first such Community Programme. A few "plant" Actions (e.g. 061 - AVEQ, 008 - GRAPEGEN and 049 - EURIGEN) of the second Programme built on and expanded previous Actions funded by the first Programme, taking into account developments in methodology of characterisation and evaluation. Furthermore, Action 020 – EFABIS (a targeted action) built on an Action from the previous Programme that had established an inventory of European farm animal genetic resources and launched activities on characterisation, conservation and utilisation of these resources. Action 020 - EFABIS basically expanded the work that had been previously conducted. These are examples of potential complementarities between the two Programmes.

In theory, there is a logical progression in science; from basic (e.g. new methods to preserve genotypes, the development of new tools to derive genomic information and understand genetic variation) to the routine application of the discovery e.g. the characterisation and utilisation of many collections (as in the Community Programmes). We know of some cases which appear to fit this scenario. Among the “animal” Actions, for example, the 020 - EFABIS targeted action complements a research action that was co-funded under FP5. Among the “plant” Actions, several partners of the 057 - AEGRO project on crop wild relatives had previously worked together on the same subject in the FP5 project "PGR Forum"; and some are now being co-funded in an FP7 project "PGR Secure" on the same subject. A similar relationship exists between the Community Programme funded actions 036 - GENBERRY and 071 - RIBESCO on the one hand with a project funded under FP7 (EUBERRY).

We are not however persuaded these are all instances of a logical progression or complementarity of work between the Framework Programme and this Community Programme. An alternative explanation is that researchers were simply looking to "Brussels" for funds to continue their work, and thus submitted applications to this Community Programme.

This view is exemplified by the fact that some of the planned tasks which could not be completed were research-oriented. For example, 049 - EURIGEN attempted to correlate basal level of gene expression of signalling and defence genes with resistance to *Magnaporthe oryzae;* because it was not successful this activity was abandoned. For 050 – EURALLIVEG, the development of the cryo-knife technology to obtain virus free accessions was not successful, as well as the polydimensional SNP analyses. In 020 - EFABIS, a central workpackage concerned with the design and implementation of environmental predictors failed to finalise and test a final version. An opposite example is provided by 040 -

HERITAGESHEEP, which was successfully completed by a highly qualified team of scientists who eschewed fundamental research activities and instead focussed on generating results that were immediately applied in the field.

Further examples of research activities in some of the Actions which, according to the expert group should not have been included, can be found in Annex 6.

Furthermore, there is some confusion regarding exploitation, as both the Community Programme and FP7 strive to exploit knowledge. The distinction on how this should happen in the two programmes should be clearer. A more integrated approach would also help ensure compliance with the International Treaty on Plant Genetic Resources for Food and Agriculture stated "*Each Contracting Party shall, subject to national legislation, and in cooperation with other Contracting Parties where appropriate, promote an integrated approach to the exploration, conservation and sustainable use of plant genetic resources for food and agriculture*".

We think it is important to avoid any future misunderstanding and to ensure that there is real complementarity between the different European measures on genetic resources in agriculture. In this respect, taking lessons from the past, the top requirement of any future work co-funded by a new Community Programme is that it should be application-focused, aiming to benefit users on the ground and to promote synergies between end-users across Europe. In this respect, we draw attention to the potentials offered by the Rural Development Programme of the EU (see next section). By the same token, when activities on conservation and sustainable use of genetic resources for food and agriculture are undertaken outside the Framework Programme, these activities should not be eligible for Community financial support under the Framework Programme (see partial list in Chapter 9).

"Biodiversity" has become the subject of a number of other policy fields, too. For example, INTERREG has funded a substantial number of projects on genetic resources for agriculture (see a partial list in Chapter 9 of this report). Furthermore, DG ENV has just published a book "European Red List of Vascular Plants" (doi:10.2779/8515) and associated website (http://ec.europa.eu/environment/nature/conservation/species/redlist/plants/wild_relatives_status.htm) listing vascular plants included in European and international policy instruments, aquatic plant species, and selected priority crop wild relatives present in Europe. The work was done under EU Commission Service Contract No. 070307/2007/483311/MAR/B2.

Since there is no central clearing house for information within the Commission, there may be other examples of such crossovers that have escaped our notice.

In conclusion, complementarities and some risks of overlaps, as described above, affected positively and negatively the coherence of this Community Programme with other EU instruments. The coherence level achieved by this Programme is considered satisfactory with room for improvement.

4.1.14. n) Application of national programmes/measures promoting the conservation, characterisation, collection and utilisation of agricultural genetic resources (including Rural Development Programmes)?

Many of the funded Actions involved partners from different nations who already knew one another via organisations such as EAAP and ECPGR. They were able to add value at national level via the "hard" results, such as harmonised databases and joint repositories of genetic material. There was also considerable "soft" added value where partners were able, via the Action, to meet one another, frequently for the first time. This latter benefit is likely to endure after the termination of the Action.

The database work will have added value at Community level in that it should improve the quality of their entries in the United Nations Food and Agriculture Organisation's world database DAD-IS (Domestic Animal Diversity Information System). The dataset for EU member states is currently 46% complete.

The Rural Development Programme of the EU is focussed on activities at national level. For example, it has already shown itself successful in preserving autochthonous breeds of livestock in Greece. It is thus an additional link between research, the Community Programme (co-funded Action 040 - HERITAGESHEEP) and *in situ* conservation on the farm. Other similar examples also exist within the EU but a more in-depth analysis of the Rural Development Programme is beyond the scope of this evaluation report.

The above are examples of potential complementarities between different EU instruments and also of potential benefits to end-users from increased synergies. In this respect, the coherence of this Community Programme with another relevant EU instrument is being achieved.

On the other hand, we have noticed a lack of clarity as to which work could be co-funded by this Community Programme on *in situ* and *ex situ* conservation, characterisation, collection and utilisation of genetic resources in agriculture and which work can be co-funded as part of the Rural Development policy, as per Council Regulation (EC) 1974/2006. A list of examples is provided in Annex 7.

4.1.15. o) Balance between national, regional, trans-national (EU and global) approaches?

Regarding animal genetic resources, some of the funded Actions had a better balance between national and trans-national approaches than others. Actions that focused on local endangered breeds understandably tended to be more focused on local conditions, circumstances and practices, while others took a wider approach on national and trans-national issues (e.g. for the development of comprehensive databases). In all cases, there was an effort for exchange of information and approach between regions participating in the same Action.

In plants, most of the funded Actions contributed to a good balance between national, regional and EU approaches. With the participation of international players, such as Bioversity International, the Community Programme has contributed to the global effort to preserve plant genetic resources.

In the future, at the global level, notably the United Nations Food and Agriculture Organisation's Commission on Genetic Resources, Council Regulation (EC) n° 870/2004 should be an important cornerstone of EU policy (e.g. in inter-sessional meetings of the International Treaty on Plant Genetic Resources for Food and Agriculture, and meetings implementing the Global Plans of Action, both animal and plants). It should be noted that the coordinators and partners of this Community Programme's Actions have accumulated much experience of Material Transfer Agreements, Access and Benefit Sharing, etc, which can certainly contribute to the formulation of the above mentioned EU policy. This would have carried even more weight had Actions had more direct involvement of end-users.

The terms of the Council Regulation 870/2004 required that teams come from several different Member States. When such teams developed guidelines, for example in the animal Action 012 - EURECA and in the plant Action 057 - AEGRO, those guidelines were in fact trans-national. This unifying tendency is much to be encouraged. It has proved a great strength of the Community Programme and it sets the work apart from other (national) programmes implemented by the Commission.

Also at the trans-national (EU) level, there are a number of long-established European associations of academics and researchers, including the EAAP for farm animals, ECPGR for crops, and EUFORGEN for forest trees. Members of these associations have participated in several Actions selected for funding under this Community Programme. While they have done a good professional work, we also draw attention to the particular merits to be derived from Actions depending on a "bottom up" approach, engaging small enthusiastic teams of "outsiders".

4.1.16. p) Effect of having a Call only once and not regularly; continuity without interruption?

In some cases such as an Action leading to the establishment of a network, a single call seems to us to have been sufficient; continuous calls might have led to a costly duplication in effort, in this regard; one of the coordinators of the funded Actions responding to the questionnaire suggested that additional calls risked duplicating existing work. However, another coordinator suggested that a second call could be useful, if it enabled an ongoing Action to be expanded to partners from additional Member (or non-Member) States. Attention was also drawn to the risk of a "fallow period" intervening at the end of one Community Program and before the start of the next. We would also comment that there was a very short period (2 months) between the publication of the call and the

closing date for submission of proposals. A longer period might have allowed a wider participation of end-users in these proposals.

We now consider the various aspects involved in having more than a single call. In the first place, new relevant issues may emerge during the lifetime of a Regulation (e.g. climate change, food safety etc rose in importance only after the end of Council Regulation 1467/94). It may be appropriate to promptly react to such topical issues. A second aspect is that successive calls give the community of proposers the chance to adjust their sights. For example, the experts who evaluated the proposals under Council Regulation 1467/94 made 13 recommendations, including "a better contribution of NGOs". The Actions selected for funding under Council Regulation 870/2004 do include more NGOs (60% of the Animal Actions but less in Plants). A third consideration in favour of more than one call is that potential applicants need time to get prepared. This is particularly true of those who are not part of one of the established networks such as EAAP and ECPGR. A fourth consideration is that proposals that fail in the first round are given the chance to strengthen the consortium and workplan, and resubmit.

In conclusion, a more continuous approach to Calls announcement would probably lead to a better implementation of recommendations and more opportunities for funding which, in view of the many species and crops not yet covered by the two Community Programmes, appears necessary. A continuous approach to Calls would also facilitate stakeholders who wish to propose a short-term Accompanying measure.

4.1.17. q) Funding rates [programme was 50% and 80%]

Many stakeholders called for an increase in the total funds available, and in the percentage reimbursement of costs. Requiring a high proportion of own contribution can deter many stakeholders from participating. Indeed, for some beneficiaries it has been costly to participate. Some Actions involved broad consortia of participants resulting in only small funding per partner, which was not proportional to the size of the allocated tasks, leading to delays and amendments of the workplan.

Coordinators of the funded Actions were canvassed in this regard, and those whose projects that had reached all their objectives and milestones tended to reply that the funding rate was sufficiently attractive. Some other coordinators, however, complained that the funding rate, or total amount, was insufficient. We note that some of these Actions (on both animal and plant) tended to have been less successful in reaching all their objectives. In short, we think that the coordinators who complained at the end of the project about the funding were probably over-ambitious from the start. We do, however, acknowledge that the result for some beneficiaries was that they ended up spending more than they received.

In conclusion, we believe that the co-funding rate of this Community Programme compromised the participation of certain organisations which might have instead participated if more attractive funding schemes were possible.

7.5 WHAT SHOULD BE DONE IN THE FUTURE

4.1.18. r) Different problems and approaches for North/South and old/new Member States?

Modern technologies for conservation, characterisation, collection and utilisation of genetic resources are relevant to and can be implemented, in principle, in all countries. There is therefore considerable added value for Member States to work together in all areas of genetic resources.

At the same time we acknowledge that important climatic, financial and cultural distinctions remain between North and South, and between Old and New Member States. For example, the preservation of old breeds tends to have lower recognition as a political issue in the newer Member States, than among the older members. Ruminants are in general more important in southern states, swine in northern ones. We believe that future EU actions should continue to take into consideration the specificities of the various eco-regional systems with regards to genetic resources of animals.

Crops are of course much more sensitive to agro-ecological conditions; for example only southern countries may want to participate in an Action such as 063 - CYNARES (though northern countries may have complementary experience with databases and quality assessment to contribute). At all events, an ecological distinction may be valid, but criteria such as the date of entry of a partner's Member State into the EU are not.

In conclusion, future Community Programmes on the utilisation of the genetic resources would continue to benefit from a focus on the widest possible geographical coverage of agro-ecologically relevant areas.

4.1.19. s) Criteria for defining endangered animal breeds and plant varieties and species in agriculture?

There are many different ways in which a breed or variety can find itself under threat, and not all of those are easy to predict. It is also difficult to define the particular unique value of any given breed or variety, which complicate the decision on the appropriate criteria and priorities in the characterisation and use of genetic resources in agriculture.

For animals, the key criterion for estimating endangeredness has been and will continue to be the number of breeding females. The figure usually quoted in the scientific literature is between 150 and 1,500[1], depending on the species. However the EU criterion is much higher (7,500 breeding females). In our opinion the best criterion is the "effective population size", which takes into account both the number of breeding animals and the degree of relatedness between them. It is not uncommon for a large population (e.g. cattle of the Holstein breed – the most numerous one in the world) to have a very small "effective population size" due to intensive long-term selection. In such cases, inbreeding becomes an issue which can potentially threaten the very existence of a breed.

A universally accepted criterion for endangeredness does not exist in plants. A possible working proposal is that - if a "core collection" of a given species has been established *ex situ* in at least two different locations, then the species is not seriously endangered. We have the impression that there are not enough such collections of either landraces or of crop wild relatives; this should be the first priority as regards "endangeredness".

4.1.20. t) How many animal breeds and plant varieties and species are considered endangered in Europe?

For animals, the best source of information is the FAO Global Data Bank DAD-IS, which makes it possible to generate a substantial quantity of information with little effort - but it may not be wholly up to date. We note for example that for 91% of national breed populations no data on population size have been reported for any of the last four years. The best available estimate is that 1,710 breeds (21% of the total) are classified as being at risk. The figure varies between species; for example, for rabbits, 38% of breeds are at risk. Many breeds are already extinct; for example, at least 194 breeds of cattle and 160 of sheep. It is of course unknown how many of these breeds were distinct or how many individual genes are no longer available.

Regarding plants, thanks to the continuing efforts of Member States and coordinating activities, existing seed and field banks cover most agriculturally important crops and species. As already mentioned, a matter of concern is the landraces and crop wild relatives. The Action 009 - EUFGIS collected information on genetic conservation units of 91 forest tree species, thereby filling an important gap in forestry.

4.1.21. u) Possibility to work with "red list" for stakeholders and managers?

The best known red-list at world level is that of the International Union for Conservation (IUCN) of wild species. The categories in that list are extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, and of least concern.

[1] Alderson, L. (1981) FAO Animal Production and Health Paper, No. 24, 53–76;. Maijala, at al. (1984) Final Report of an EAAP Working Party, Livestock Production Science, 11:3–22.

At EU level, the IUCN together with the European Commission (DG ENV) have established a review list of the conservation status of about 6,000 wild species found in the EU.

Although domestic and farm animals do not figure on either of these lists, they may be of some use in fields such domestication (link to wild ancestors), the utilisation of natural resources and threats posed by stress.

At national level, national lists of endangered animal breeds could be used to define the scope for financial support under particular programmes. They could also provide an approach to define public interest in terms of conservation of local ("national") biological diversity. A European red list could then be developed, based on these national lists. Harmonisation of criteria regarding the definition of an endangered breed across country would be needed, and could be delivered in a new Community Programme (provided that all the appropriate Member States were involved).

As regards agricultural plants and forest trees we draw attention to the "state of the world plant genetic resources" country reports available at http://www.fao.org.

4.1.22. v) Which further actions should be encouraged at national and EU levels and beyond?

In situ conservation activities should continue to be supported through programmes implemented at regional/national level, where local circumstances are well understood. At EU level, undoubtedly the first priority is to harmonize efforts, policies, databases, etc between Member States. As regards databases, Europe is still lacking a permanent single portal to the various relevant databases, as previously discussed.

As regards threatened animal genetic resources, the most important are those resources (breeds) that are currently perceived to have little or no utility. The most basic "no-regrets" action would be to ensure that genetic material has been preserved. A more engaged approach would be to screen such breeds for unique genetic characteristics and/or develop breeding programmes for genetic improvement. In the medium to long term, it is going to be important to ensure a substantial and wide genetic base of all domestic animals, in order to be able respond to unforeseen challenges (e.g. climatic change, new market circumstances, new legislation). This will require: (i) the development of strategies for the management of genetic diversity in order to maintain a broad genetic base, (ii) measures to increase the efficiency and profitability of less intensive and small scale animal farming associated with endangered breeds, and (iii) the implementation of knowledge on differences in genetic structures between breeds and their role in farm animal agriculture.

All of the above require long-term commitment. Based on past experience, we have some doubts whether the five or seven year funding cycle is an appropriate vehicle for such activities.

While thinking about animal genetic resources it should be remembered that aquaculture is emerging as the world's fastest-growing source of animal protein. This issue was also raised in stakeholder input and response to the questionnaire. Therefore the priority of any future Community Programme should be extended to include genetic resources of aquaculture species.

As regards both plant and animal genetic resources, we still need more work on better and more refined phenotyping especially traits related to health, fitness and product quality. An activity of potential interest would be to support the transfer and use of established "omics" techniques and of existing genetic resource collections for the benefit of end-users in agriculture.

Further activities recommended for support by a new Community Programme include a concerted action on the preservation of plant landraces that would bring together projects that are already in progress at national level, thus adding the sort of transnational value identified in the present Programme.

Any future actions should be structured to encourage a more active participation of relevant Small and Medium Enterprises and of farmer organisations/associations (e.g. those that are engaged in low-input farming, niche animal products, specialist products from heirloom plant varieties etc).

Some of the most desirable developments (e.g. cryo-banks) are likely to be too expensive for any one Member State to maintain, while many of the supporting technologies (e.g. databases) show large advantages of scale. There is, therefore, substantial scope for future improvement, via better coordination of national efforts.

In summary, future activities should focus on rational utilisation of genetic resources including agriculturally relevant microbes and other organisms, and greater involvement of end-users that are active in the area of sustainable agriculture. Closer integration across the European Commission is desirable so as to promote the complementarity between research and utilisation of genetic resources in agriculture.

Table 1. A summary of all funded Actions under Council Regulation 870/2004.

Action code	Action Acronym	Type	Species	Conservation	Characterisation	Collection	Utilisation Outcomes	Contribution to the Community Programme	Final Evaluation Report
001	LEAFYVEG	Targeted	Leafy vegetables	ex situ	1950 accessions phenotypically characterised		Database, accessions ready to reintroduce to farming, accessions identified for breeding	(i) Establishment and coordination of permanent interlinked ex situ collections; (ii) activities leading directly to the use of conserved material	Yes (Good)
008	GRAPEGEN	Targeted	wild and cultivated grapevine	mainly ex-situ	4,000 accessions analyzed using molecular markers; morphological data recorded on 2,382 cultivars	218 new accessions	Results accessible on web site including variety identity cards; Publications; Dissemination to growers including wine testing	(i) Establishment, maintenance and improvement of we-based European central crop database; (ii) Characterisation and evaluation of genetic resources	Yes (Satisfactory)
009	EUFGIS	Targeted	Forest Trees	Mostly in situ	>3,000 populations	>3,000 accessions	Databases	(i) Only action promoting information exchange on methods, techniques and experiences with forest genetic resource conservation and management; (ii) web-based European network	Yes (Good)

Table 1. A summary of all funded Actions under Council Regulation 870/2004.

Action code	Action Acronym	Type	Species	Conservation	Characterisation	Collection	Utilisation Outcomes	Contribution to the Community Programme	Final Evaluation Report
012	EURECA	Targeted	Cattle	In situ, Ex situ		16 existing breed data	Databases, Guidelines	(i) Promote work at Member States; (ii) Good EU geographical coverage; (iii) Strategies for the profitability of local breeds	Yes (Good)
018	CROCUS	Targeted	Crocus species	ex situ	about 2000 accessions phenotypically characterised	about 900 new accessions	Database, linked with worldwide collection, some accessions were given to breeders	(i) European web-based network; (ii) Characterisation and evaluation of genetic resources	Yes (Satisfactory)
020	EFABIS	Targeted	Livestock species	In situ, ex situ			Databases, Genebank management, Guidelines	(i) Establishment of a permanent European web-based network on national inventories; (ii) Development of European standards and requirements for conservation; (iii) Development of interlinked cryopreservation collections; (iv) Geographical coverage	Yes (Satisfactory)
036	GENBERRY	Targeted.	strawberry, raspberry	mostly ex-situ	92 accessions molecularly characterised and 80 phenotypically	172 existing accessions	Database	(i) Establishment of a permanent European web-based network on national inventories	No

Table 1. A summary of all funded Actions under Council Regulation 870/2004.

Action code	Action Acronym	Type	Species	Conservation	Characterisation	Collection	Utilisation Outcomes	Contribution to the Community Programme	Final Evaluation Report
040	HERITAGESHEEP	Targeted	Sheep	In situ, ex situ		49 existing breed data, 15 breed germplasm	Genebank, Database, Breeding programmes, Guidelines	(i) Development of European standards and requirements for conservation; (ii) Development of interlinked cryopreservation collections; (iii) Evaluation of animal genetic resources useful for agriculture; (iv) Development of strategies to support the profitability of local breeds; (v) Development of strategies for the promotion of under-utilised animal genetic resources.	Yes (Good)
049	EURIGEN	Targeted	Rice	ex situ (seeds)	455 accessions molecularly characterised of which 200 also phenotypically	455 existing accessions	Web-based database; seed stock repository; DNA biorepository	(i) Establishment of a comprehensive publicly available database; (ii) Characterisation and evaluation of genetic resources;	Yes (Good)
056	EURALLIVEG	Targeted	Garlic and shallot	ex-situ cryo-conservation	About 300 accessions		Training courses, database, accession catalogue.	(i) Establishment, maintenance and improvement of we-based European central crop database; (ii) Establishment and coordination of permanent inter-linked ex-situ collections	Yes (Satisfactory)

Table 1. A summary of all funded Actions under Council Regulation 870/2004.

Action code	Action Acronym	Type	Species	Conservation	Characterisation	Collection	Utilisation Outcomes	Contribution to the Community Programme	Final Evaluation Report
057	AEGRO	Targeted.	*Avena Beta Brassica Prunus*		242 accessions phenotypically characterised		Database, congress		Yes (Satisfactory)
061	AVEQ	Targeted	Several species of the *Avena* genus	ex situ (seeds)	668 accessions characterised phenotypically	668 existing accessions	Database, dissemination, links with organic farming systems	(i) Characterisation and evaluation of genetic resources	No
063	CYNARES	Targeted	artichoke and cardoon	ex-situ	150 accessions characterized molecularly and phenotypically	438 accessions many of which were just gathered from already existing in national collections	Booklet with data of the evaluation on the website	(i) Information exchange; (ii) Establishment and coordination of European conservation network	Yes (Satisfactory)
066	ELBARN	Concerted	Livestock species			641 existing breed data	Databases, Conservation Rescue and "Ark" Centres, National Contact Points	(i) Establishment of a permanent European web-based network on national inventories; (ii) Establishment of a European network of "Ark Centres"	Yes (Good)

Table 1. A summary of all funded Actions under Council Regulation 870/2004.

Action code	Action Acronym	Type	Species	Conservation	Characterisation	Collection	Utilisation Outcomes	Contribution to the Community Programme	Final Evaluation Report
067	GLOBALDIV	Accompanying	Livestock				Databases, Website, Training	(i) Organisation of seminars, workshops, training courses	Yes (Good)
068	SAFENUT	Targeted	Hazelnut and almond	in situ	233 accessions phenotypically characterised	140 new accessions	database, publication, close contact with breeders, growers and industry	(i) Information exchange; (ii) Characterisation and evaluation of genetic resources	Yes (Good)
071	RIBESCO	Targeted	Several species of the *Ribes* genus	ex situ (fieldbanks, cryopreservation, in vitro)	1400 accessions phenotypically characterised of which 800 also molecularly	1400 existing accessions - collection upgrade	1 database developed and 1 upgraded	(i) Upgrade/clean up of a European collection	Yes (Good)

CHAPTER 8 - CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The independent experts conclude that Council Regulation (EC) No 870/2004 (24 April 2004) "establishing a second Community Programme on the conservation, characterisation, collection and utilisation of genetic resources in and repealing Regulation (EC) No 1467/94" has:

1. Stimulated considerable interest among various groups of stakeholders within the European Union and beyond.
2. Promoted collaboration among diverse groups of stakeholders in different countries.
3. Led to the establishment of useful links and partnerships across Europe.
4. Advanced the understanding of some local practices and needs.
5. Led to useful results and guidelines for the conservation of valuable genetic resources.
6. Established well characterised and evaluated core collections and cryo-banks of various plant and animal species.
7. Improved the scientific knowledge on the nature, management and potential of genetic resources of some species of farm animals, crops and forest trees in Europe.

In addition:

8. Because of considerable emphasis on scientific activities relative to their implementation in practice, although the characterisation, collection and conservation aspects of agricultural genetic resources were effectively addressed for the species studied, the utilisation component of the Programme was not addressed to the same extent.
9. In some cases the structure of reimbursing costs made it difficult for certain organisations to participate.
10. In some cases, the project results, although potentially relevant, were not available to the end users.
11. A number of newly developed databases and established ones were used to accommodate the data generated but open access to these results was not always possible. Furthermore, no mechanism was put in place to facilitate accessibility to the results via a single European portal.
12. Long-term benefits of conservation may not be realised due to the high costs of relevant activities.

Recommendations

In view of the above, the independent experts make the following recommendations:

1. The EC Programme on agricultural genetic resources should continue, building on the successes of the two previous Programmes. Ways should be found to reduce the administrative burden on coordinators in order to improve the effectiveness of project execution and delivery of results.

2. A new Community Programme should require that the primary objective of selected Actions be the delivery of appropriate utilisation of agricultural genetic resources in practice. To attain this objective, an increased involvement of end-users and Small and Medium Enterprises in the funded Actions should be promoted, to ensure the immediate transfer and implementation of project results.

3. The new Community Programme must harness all recent scientific and technological developments, which can offer improvements in the speed and efficacy of characterisation of agriculturally relevant traits. The aim should be the practical application of recent scientific advances to the conservation and utilisation of genetic resources in agriculture. To this end, participation of applied research organisations in combination with the end-users mentioned above should be encouraged.

4. Another important emphasis of the new Community Programme should be on adding value at EU level through the harmonisation of efforts, policies and programmes on the conservation and utilisation of the agricultural genetic resources across all Member States.

5. Activities that promote the evaluation and exploitation of agriculturally important interactions between microbes and farm animals/crop plants that have been identified and characterised in previous research should be encouraged.

6. Another priority of the new Community Programme should be the conservation, characterisation and utilisation of genetic resources for fresh-water and marine aquaculture.

7. The new Community Programme should also focus on plant species for production of biomass and industrial products.

8. Options should be explored for better coordination of relevant EC programmes with the objectives of achieving economies of scale, avoiding overlaps, creating positive synergies and leading to outcomes for end-users.

9. Given the high costs of long-term conservation, a new Community Programme should support relevant activities that have the potential to eventually generate income for the end-users. The aim should be that the conservation and utilisation of these agricultural genetic resources become self-supporting.

10. Before the launch of any new programme, the Commission should organise a two-day meeting of stakeholders to discuss the modalities and to start build interest groups.

CHAPTER 9 - ANNEXES

Annex 1: Documents provided by the Commission to the experts

The following documents were provided by the Commission to the experts at their first meeting and some others were added by the experts.

1. First Community Programme
   - Council Regulation (EC) No 1467/94:
   - Report from the Commission to the Council and the European Parliament on the implementation of Council Regulation (EC) No 1467/94 (mid term situation)
   - Report from the independent expert group to the Commission on the implementation of Council Regulation (EC) No 1467/94
   - Brochure: Genetic resources in agriculture (1994-1999)

2. Second Community Programme
   - Council Regulation (EC) No 870/2004, especially Article 14
   - Work Programme
   - Leaflet: Preserving genetic resources in agriculture (2006-2011)

3. Rural Development Policy
   - Council Regulation (EC) No 1698/2005, especially Article 39(5)
   - Council Regulation (EC) No 1974/2006, especially Articles 27(4) and 28
   - European Court of Auditors: Is Agri-Environment support well designed and managed?

4. Biodiversity strategy
   - Communication "Our life insurance, our natural capital: an EU biodiversity strategy to 2020" (COM 2011 - 44 final)
   - Biodiversity Action Plan "Halting Biodiversity loss by 2010 - and beyond: sustaining ecosystems services for human well being" COM 2006 - 216 final

5. DG RESEARCH (DG RTD)
   - Research Framework Programmes FP6 and FP7

6. DG HEALTH & CONSUMERS (DG SANCO)
   - Background
   - EU legislation on marketing of seeds and propagating materials

7. DG ENVIRONMENT (DG ENV)
   - LIFE+ Regulation (EC) No 614/2007
   - Text of the Convention on Biological Diversity
   - Text of the Nagoya Protocol on Access and Benefit-sharing

8. Communications
   - Communication from the Commission to the European Parliament and the Council on the European Innovation Partnership 'Agricultural Productivity and Sustainability' 29.02.2012

9. FAO
   - The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture
   - The State of the World's animal genetic resources for food and agriculture
   - Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture
   - Global Plan of Action for Animal Genetic Resources

10. EASAC policy report 17 - European Academies Science Advisory Council "Plant genetic resources for food and agriculture: roles and research priorities in the European Union.

11. ITPGRFA
    - The International Treaty on Plant Genetic Resources for Food and Agriculture

Annex 2: A sample of actions co-funded by INTERREG.

- INTERREG III "Cross-border fruit tree genetic resources and biodiversity" Management and development of Franco- Walloon fruit tree biodiversity
- INTERREG IVC "Reverse - European Project to preserve Biodiversity"
- INTERREG II Italy - Albania Cooperation Programme
- INTERREG IIIB GENMEDOC An interregional network of Mediterranean seed banks
- INTERREG IIIB SEMCLIMED
- INTERREG IIIB CASTANEA REG
- INTERREG IVC Programme Report for The Managing Authority (December 2006)
- INTERREG IIIA Research for Plant Breeding in Slovakia and Austria
- INTERREG II Breeding of Grapevine germplasm and production of improved viticultural products
- INTERREG IIIA Conservation and utilization of the Balkan flora
- INTERREG IIIA Enhancement, sanitation and production of local vines and wines.
- INTERREG II Integrated software development for monitoring and management in NATURA 2000 protected areas in Greece and Italy.
- INTERREG IIIA Gene Save
- INTERREG/CARDS-PHARE: MARCBAL PROJECT Marchigiana Cattle Breed in Western Balkans. A cross-border cooperation and sustainable development plan.
- INTERREG IIIB CADSES 2007 - 2011: Integrated management of biological and landscape diversity for sustainable regional development and ecological connectivity in the Carpathians
- INTERREG III C EAST VINUM EST
- INTERREG IIIB GENMEDA

Annex 3: Some projects on plant genetic resources co-funded by FP7

- ABSTRESS Improving the resistance of legume crops to combined abiotic and biotic stress
- ADAPTAWHEAT Genetics and physiology of wheat development to flowering: tools to breed for improved adaptation and yield potential
- AFSPAN Aquaculture for Food Security, Poverty Alleviation and Nutrition
- AGFOODTRADE Quantifying trade liberalisation in a changing world
- AGREE Agriculture and Energy Efficiency
- AGROCOS Screening natural products for cosmetics and biopesticides
- ANIMALCHANGE AN Integration of Mitigation and Adaptation options for sustainable Livestock production under climate CHANGE
- ARPAARI Assessment of research potential of Aegean agricultural research institute
- BIOBIO Indicators for biodiversity in organic and low-input farming systems
- CONGRESS Conservation genetic resources for effective species survival
- ECOLOGY-EPN-FOOD WEB Molecular and ecological approaches to study soil food webs for enhancing biological control of insect pests and monitoring disturbances
- EPPN European plant phenotyping network
- EUBERRY The sustainable improvement of European berry production, quality and nutritional value in a changing environment: strawberries, currants, blackberries, blueberries and raspberries
- FORESTFLOWERS Expressed sequences (EST) as tags for functional genes for genetic characterisation of flowering woody ornamental shrubs from an oriental origin
- FORESTTRAC forest ecosystem genomics research: supporting transatlantic cooperation
- FORGER Towards the Sustainable Management of Forest Genetic Resources in Europe
- FRUIT BREEDOMICS Integrated approach for increasing breeding efficiency in fruit tree crops
- GENCOMMONS Institutionalizing global genetic-resource commons. Global Strategies for accessing and using essential public knowledge assets in the life sciences.
- GENOLIVE Historical genomics of the Mediterranean olive tree
- IPRABIO Integrating new practices in programs of Biological Control against Agricultural pests
- PGR SECURE Novel characterization of crop wild relative and landrace resources as a basis for improved crop breeding
- PLANT SPECIATION A multilocus approach to the phylogenetic inference of an island and continental plant radiations
- PROCOGEN Promoting a functional and comparative understanding of the conifer genome-implementing applied aspects for more productive and adapted forests.
- QUINOA Dynamic aspects of biodiversity management of Quinoa
- SOLIBAM Strategies for Organic and Low-input Integrated Breeding And Management
- TEEMBIO Toward Eco-Evolutionary Models for BIODiversity Scenarios
- TREES4FUTURE Designing Trees for the future

Annex 3b: Some activities on plant genetic resources in the COST programme

- Triticeace genomics for the advancement of essential European crops (TritiGen) http://www.cost.eu/domains_actions/fa/Actions/FA0604
- Cryopreservation of crop species in Europe http://www.cost.eu/domains_actions/fa/Actions/871
- East-West Collaboration for Grapevine Diversity Exploration and Mobilization of Adaptive Traits for Breeding http://www.cost.eu/domains_actions/fa/Actions/FA1003
- Evaluation of Beech Genetic Resources for Sustainable Forestryhttp://www.cost.eu/domains_actions/fps/Actions/E52
- Genosilva : European Forest Genomics Network http://www.cost.eu/domains_actions/fps/Actions/E28

Annex 4: List of stakeholders receiving invitation to the questionnaire

Access keys to the stakeholder questionnaire were sent to the permanent representations of the 27 member states (two keys each), to an initial list of 104 stakeholders, to the coordinators of the 17 actions, and to a further twelve stakeholders who asked to participate.

List of member state countries invited to participate in stakeholders Questionnaire

- BE Belgie-Belgique
- BG Bulgaria
- CZ Ceska Republika
- DK Danmark
- DE Deutschland
- EE Eesti
- IE Eire - Ireland
- EL Greece
- ES España
- FR France
- IT Italia
- CY Kypros-Kibris
- LV Latvija
- LT Lietuva
- LU Luxembourg
- HU Magyarorszag
- MT Malta
- NL Nederland
- AT Osterrriech
- PL Polska
- PT Portugal
- RO Roumania
- SI Slovenija
- SK Slovensko
- FI Suomi-Finland
- SE Sverige
- UK United Kingdom

List of stakeholders invited by the Commission

- A.E.I.A.R. European Association for Rural Development Institutions
- AER / ARE Assembly of European Regions
- AgrBiodiversity Network Monitoring Institute for Rare Breeds and Seeds in Europe
- APURE / URE Association for the European rural universities
- AREPO European Association of Geographical Indicators
- ARGE Europaische ARGE Landentwicklung und Dorfemeuerung

- BEUC European Consumers Organisation
- Bioversity Bioversity International
- Birdlife International Partnership of conservation organizations to conserve birds
- BusinessEurope Confederation of European Business (ex UNICE)
- CEETTAR European Organisation of Agricultural and Rural Contractors
- CEI-Bois European Confederation of woodworking industries
- CEJA European Council of Young Farmers
- CEL / ECF European Climate Foundation
- CELCAA European Liaison Committee for Agricultural Cooperation in the European Union
- CEMR / CCRE Council of European Municipalities and Regions
- CEPF Confederation of European Forest Owners
- CEPI Confederation of European Paper Industries
- CEPS European Spirits Organisation
- CIAA Confederation of Food and Drink Industry in the EU
- CIOPORA International Community of Breeders of Asexually Reproduced Ornamental and Fruit Plants
- COFACE Confederation des Organisations Familiales de la Communaute Europeenne
- COPA/COGECA Committee of Professional Agricultural Organisations / General Committee for Agricultural Cooperation in the European Union
- CPIV Permanent International Vinegard Committee
- CPVO Community Plant Variety Office
- CR Credit Agricole
- CRPM/CPMR Conference of Peripheral Maritime Regions
- EAAP European Federation for Animal Science
- EARTO European Association of Research and Technology Organisations
- EBB European Biodiesel Board
- ECBA European Countries Biologists Association
- ECNC Biodiversity and sustainable development
- ECOVAST European Council for the Village And Small Town
- ECPA European Crop Protection Association
- ECPGR European Cooperative Programme for Plant Genetic Resources
- ECVC European Coordination Via Campesina (Réseau Sémences Paysannes)
- EEB / BEE European Environmental Bureau
- EFFAB European Forum of Farm Animal Breeders
- EFFAT European Federation of Trade Unions in the Food, Agriculture and Tourism sectors
- EFNA European Forest Nurseries Association
- EFNCP European Forum on Nature Conservation and Pastoralism
- EFOV European Federation of Origin Wine
- ELARD/LEADER European LEADER Association for Rural Development
- ELO European Landowners Organization
- EOMF European Observatory of Mountain Forests

- ERFP European Regional focal Point for Animal Genetic Resources
- ESA European Seed Association
- ETUC European Trade Union Confederation
- EUCARPIA European Association for Research on Plant Breeding
- EUFORGEN European Forest Genetic Resources Programme
- EUPPA European Potato Processors
- EURADA European Association of Development Agencies
- EuroChambers European Asociation of Chambers of Commerce and Industry
- EUROCOMMERCE Retail Wholesale and International Trade Representation to the EU
- EuroCoop European Community of Consumer Co-operatives (Food & Water Europe)
- EUROGITES European Federation of Rural Tourism
- Eurogroup for Animals Eurogroup for Animals
- EUROMONTANA European Association of Mountain Regions
- EURONATUR European Nature Heritage Fund
- EUROPABIO European Association of Bioindustries
- EUROPATAT European Potato Trade Association
- EWL/LEF European Women's Lobby
- FACE Federation of Associations for Hunting and Conservation of the EU
- FAO (animals) Food and Agriculture Organization of the United Nations
- FAO (plants) FAO Plant Genetic Resources and Seeds
- FAO's CGRFA FAO's Commission on Genetic Resources for Food and Agriculture
- FEBO European Timber Trade Association
- FECOF European Federation of Municipal and Local Community Forests
- FoodDrinkEurope European food and drink industry
- Forum Synergies Sustainable practices in rural areas
- Friends of the Earth Friends of the Earth
- FTA Foreign Trade Association
- FTAO Fair Trade Advocacy Office
- FVE Federation of Veterinarians of Europe
- GRAIN Grain
- GREENPEACE Greenpeace EU Unit
- IABG Interntional Association of Botanic Gardens
- ICAR International Committee for Animal Recording
- IFOAM EU GROUP International Federation of Organic Agriculture Movements
- IISD International Institute for Sustainable Development
- ITPGRFA International Treaty on Plant Genetic Resources for Food and Agriculture
- IUCN World Conservation Union – Regional Europe Office
- Mountain Forum Mountain Forum
- NordGen NordGen director
- OECD Sustainable Agriculture

- OECD Trade and Agriculture (TAD) Directorate
- OECD Consumer Policy
- OECD Sustainable Development – Green Innovation
- OECD OECD Environmental contact (Biodiversity, Environment and Development
- OEIT European Organisation of Tomato Industries
- OIE World Organisation for Animal Health
- ORIGIN EU Organisation for an international Geographical Indications Network
- PREPARE NETWORK Partnership for Rural Europe
- RBI Rare Breeds International
- RED / MER European Countryside Movement
- SAVE Foundation Safeguard for Agricultural Varieties in Europe
- SEVA Sustainable Agriculture and Environmental Voluntary Action
- UEAPME European Association of Craft, Small and Medium-sized Enterprises
- UECBV European Livestock and Meat Trading Union
- UEF Union of European Foresters
- UIOE International Union of Winemakers
- UPOV International Union for the Protection of New Varieties of Plants
- USSE Union des Syliviculteurs du Sud de l'Europe
- WWF / EPO World Wildlife Fund of Nature

List of Stakeholders who requested to participate

- Arche Noah
- Bifurcated Carrots
- Bio d'Aquitaine
- BDD Biodynamic Agricultural Association
- Bioversity Bioversity International
- CABI UK
- CRA-Fruit Tree Research Centre
- DKN - Dachverband Kulturpflanzen- und Nutztiervielfalt e.V.
- GM-Free Cymru
- Italian Association for Organic Agriculture (AIAB)
- Pesticide Action Network
- Red de Semillas Resembrando e Intercambiando
- Slow Food International

List of the coordinators of 17 co-funded actions invited to participate in Stakeholders Questionnaire as well as in Coordinators Questionnaire

Chapter 9 - Annexes

1. Action 001. Leafy Veg. CGN – Centre for Genetic Resources – DLO - Stichting Dienst Landbouwkundig Onderzoek, NL.
2. Action 008. GrapeGen - INRA Institut National de Recherché Agronomique, France.
3. Action 009. EUFGIS –Bioversity International - IPGRI - International Plant Genetic Resources Institute. Maccarese, Italy.
4. Action 012 EURECA – WUR –Wageningen University Research - Stichting Dienst Landbouwkundig Onderzoek (DLO). Lelystad, NL.
5. Action 018 – CROCUS UCLM Universidad de Castilla-La Mancha, Spain.
6. Action 020 EFABISnet – EAAP European Association of Animal Sciences
7. Action 036 GENBERRY INRA - Institut National de Recherche Agronomique, France.
8. Action 040 - Heritage Sheep – UoY - The University of York (). York, UK.
9. Action 049 – EURIGEN FPTP - Fondazione Parco Tecnologico Padano Foundation, Italy.
10. Action 050 – EURALLIVEG – IPK - Leibniz Institut für Pflanzengenetik und Kulturpflanzenforschung / Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany.
11. Action 057 AEGRO - BAZ - Bundesanstalt für Züchtungsforschung an Kulturpflanzen / Federal Centre for Breeding Research on Cultivated Plants, Germany .
12. Action 061 – AVEQ - BAZ Bundesanstalt für Züchtungsforschung an Kulturpflanzen/Julius Kühn-Institute Federal Research Centre for Cultivated Plants, Germany.
13. Action 063 – Cynares – TU - Università degli Studi della Tuscia / Tuscia University (TU), Italy.
14. Action 066 – ELBARN - EURONATUR - Stiftung Europäisches Naturerbe, Germany.
15. Action 067 – GLOBALDIV - UCSC - Università Cattolica del Sacro Cuore, Italy.
16. Action 068 – SAFENUT – ENEA - Ente per le Nuove Tecnologie, L'Energia e L'Ambiente / National Agency for the New Technologies, the Energy and the Environment, Italy.
17. Action 071 – RIBESCO - MTT Agrifood Research, Finland.

Annex 5: The Stakeholders questionnaire

QUESTIONNAIRE FOR THE CONSULTATION OF STAKEHOLDERS ON THE COMMUNITY PROGRAMME ON GENETIC RESOURCES IN AGRICULTURE – Council Regulation (EC) No 870/2004

It would be very much appreciated if the questionnaire could be completed in English.

PLEASE DO NOT FORGET TO SEND THE COMPLETED QUESTIONNAIRE
BY 31 DECEMBER 2011 AT THE LATEST

Please do not use for any of the questions
more than 250 words (except where indicated otherwise)!

Name of organisation:	
Main field of interest:	

Section 1 - Community programme established by Council Regulation No 870/2004

1. In your view, which are the main benefits of conserving agricultural genetic resources (max 5 choices)?
   a. Agronomic and/or economic advantages/benefits
   b. Consumer attraction /interest
   c. Environmental benefits (biodiversity)
   d. Food quality
   e. Food security
   f. Human health
   g. Larger products range (diversification, products offer)
   h. Non-tangible benefits (cultural, ethical)
   i. No regret strategy in case of future needs
   j. Scientific interest
   k. Other (please specify) ……

Please explain your choice (max 500 words):……..

2. Are you familiar with the Community programme established by Council Regulation No870/2004? If you are not familiar with the Community programme, please go to Section 2

3. If your organisation is involved in conserving genetic resources diversity in agriculture (including actions under the Community programme established by Council Regulation No 870/2004) please provide brief details of its activities.
4. The Community programme had the objective "to help ensure and improve conservation, characterisation, collection and use of plant, animal & microbial genetic resources". To what extent has the objective been realised?
5. A second objective was "to co-ordinate and harmonise actions in Member States with a view to reinforcing the Community's efforts and eliminating duplication of effort". To what extent has the objective been realised?
6. A third objective was "to promote an effective information exchange between the Community main actors and the relevant organisation concerned by genetic resources in agriculture". To what extent has the objective been realised?
7. A fourth objective was "to be multidisciplinary and to built constructive collaboration between partners (e.g. the various stakeholders including gene banks, non-governmental organisations, technical institutes, breeders, farmers, gardeners and the forest sector)". To what extent has the objective been realised?
8. In your view, what are the specific positive (or negative) effects that can be expected from the Community programme?
9. Do you have any views on the organisational and administrative handling of the Community programme? If the programme were to be renewed, what in your opinion should be maintained and what should be modified or abandoned?

Section 2 - Community programme, Rural Development Policy & Research Framework Programme

10. According to your knowledge, which measures on the conservation of endangered genetic resources in agriculture or the use of traditional and local agricultural genetic resources (plant varieties/landraces and animal breeds) have been promoted under Rural Development Programmes in your region(s) and/or country (max 500 words)?
11. In your opinion, what are the advantages and disadvantages of the three different types of measures, used for the conservation of genetic resources in agriculture: Rural Development Policy; Community Programme on Genetic Resources; EU Research Framework Programme? How could these measures complement each other in a meaningful manner?

Section 3 – Identifying needs and objectives

12. In your views, which sector could benefit in particular from efforts to conserve genetic resources in agriculture (max -5 choices)?
    a. Agri-food industry
    b. Biotechnology industry
    c. Other industry (please specify) …….
    d. Botanical and zoological gardens
    e. Breeders
    f. Consumers
    g. Farmers
    h. Scientific bodies
    i. Tourism
    j. Other (please specify) …….

Please explain your choice (max 500 words):

13. Which of the existing initiatives and activities of EU and other organisations do you consider to be most relevant for the conservation of genetic resources in agriculture? Please choose 5 out of the following possibilities:

a. EU Community programme (Council Regulation No 870/2004)
b. EU Rural Development Policy
c. Other relevant measures applied under EU Common Agriculture Policy
d. EU Research Framework Programmes
e. EU Biodiversity Strategy
f. EU legislation on the protection of intellectual property rights
g. Other EU policies (e.g. propagating material and zoo-technical legislation)
h. Activities of the UN-Food and Agriculture Organisation (FAO)
i. Convention on Biological Diversity (CBD), incl. the Nagoya protocol
j. European cooperative Programme for Plant Genetic Resources (ECPGR)
k. European Forest Genetic Resources Programme (EUFORGEN)
l. European Regional Focal Point for Animal Genetic Resources (ERFP)
m. International Treaty on Plant Genetic resources for Food and Agriculture
n. International Plant Protection Convention (IPPC)
o. World Organisation for Animal Health (OIE)
p. Other (please specify)……..

What should be modified or strengthened in order to enhance the effectiveness of the selected initiatives and actions (max 500 words)?

14. In your opinion, which is the impact of the EU seed and propagating material and zootechnical legislation on actions, including farming practises, relevant for the conservation of genetic resources diversity?

15. In your opinion what would be the most effective and efficient approaches to encouraging actors (including farmers, breeders, up-stream and down-stream industry, scientists, and others) at local, regional, national, and European levels to engage in the conservation of agricultural genetic resources in their habitat (in situ) and outside their habitat (ex situ)?

16. With respect to decisions on different types of measures and their implementation, which role should be attributed to the local, regional, and national level? Which decisions and which types of action should be undertaken specifically at the EU level?

17. The main objectives of the Community Programme on Genetic Resources are "to help ensure and improve conservation, characterisation, evaluation, collection, documentation, development and use of […] genetic resources". How far do these objectives correspond to relevant needs? Which other objectives should be pursued?

18. In view of ensuring the most effective use of resources devoted to the conservation of genetic resources, which priority should be given to the items listed below. Please provide a ranking from top (1) to bottom (7).

a. characterisation
b. collection
c. collection maintenance & updating
d. conservation
e. development of genetic diversity (level of populations)
f. documentation (such as Web-based inventories)
g. evaluation
h. use

19. In view of ensuring the most effective use of resources devoted to the conservation of genetic resources, which relative importance should be given to the different types of conservation actions?
   a. only in situ conservation of genetic resources
   b. in situ > ex situ
   c. in situ = ex situ
   d. in situ < ex situ
   e. only ex situ

Please explain your choice:

20. In your view, how far could an EU-wide lists of endangered breeds and plant varieties (e.g. the " list of endangered local breeds in danger of being lost" and "plants under threat of genetic erosion" used for Rural Development Programmes - Regulations 1698/2005 and 1974/2006 - Annex IV) be useful for the implementation of a possible future EU-Community programme?

21. Which priority should be given to the different types of actions, listed below, supporting in situ conservation at farm level? Please provide a ranking from top (1) to bottom (7).
   a. Communication
   b. Innovation
   c. Knowledge transfer
   d. Networking
   e. Training
   f. Other (please specify):……

Please explain your choice for the 3 top ranking actions:

22. Which priority should be given to the different types of actions, listed below, supporting ex situ conservation? Please provide a ranking from top (1) to bottom (10).
   a. Centralisation of database & collections
   b. Development of database & collections
   c. Maintaining & updating databases & collections
   d. Centralised collection of cryopreserved samples
   e. Funding
   f. Innovation
   g. Knowledge transfer
   h. Networking
   i. Training
   j. Other (please specify):……

Please explain your choice for the 4 top ranking actions:

23. In your view, which are the most relevant obstacles to valorise under-utilised crops and animal species and traditional varieties and breeds? How could these obstacles be overcome?

24. In your view, what are the priority areas regarding conservation and sustainable use of genetic resources of agriculturally relevant microorganisms and invertebrates? Please provide a ranking from top (1) to bottom (6).
   a. Agro-industry microorganism
   b. Bio-control microorganisms
   c. Pest and disease (used in breeding programs)
   d. Plant & animal health microorganism
   e. Soil biodiversity
   f. Other (please specify):……

Please explain your choice for the 3 top ranking actions:

25. In your opinion, what would be the link between securing product quality (and quantity) and the conservation and sustainable use of genetic resources in agriculture and what should be done in this respect?
26. How far could short food supply chains help promoting the use of traditional and local agricultural or underutilised genetic resources?
27. Other comments & suggestions

Annex 5b: Specific Questions to Coordinators of the 17 funded actions of the Community Programme on Genetic Resources in Agriculture

1. Action

Number/Acronym of your action:

2. Species

Please indicate the plant or animal species involved in your action

3. Conservation

a) Plants

Approximately how many new accessions were added:

- to in-situ collections?
- to ex-situ collections?
- to ex-situ genebanks?

If you created new core collections, please briefly describe.

b) Animals

Approximately how many animal breeds were conserved (in-situ, ex-situ, local or endangered or major breeds)?

4. Characterisation

a) Plants

Approximately how many accessions (cultivars, landraces, crop wild relatives) were newly characterised?

For cultivars, landraces, and crop wild relatives that were studied in-situ:

- Approximately how many populations were located and identified in situ?
- How many in-situ populations were sampled and newly characterised?
- Approximately how many passport characters did you characterise per accession or population (on average)?
- Approximately how many other characters did you characterise (on average)?

b) Animals

Approximately how many animal breeds (local or endangered or major breeds) were characterised?

5. Collection

a) Plants

Approximately how many new accessions (cultivars, landraces, crop wild relatives) have been added to collections?

How many populations of crop wild relatives were newly located and protected?

Regarding stored data, please briefly describe the data and the database where the collected information is held

b) Animals (Cryo-preservation, in-situ and databases)

Approximately how many animal breeds (local or endangered or major breeds) were cryo-preserved?

How many animal breeds (local or endangered or major breeds) were preserved in-situ

Regarding stored data, please briefly describe the data and the database where the collected information is held

6. Utilisation

Did your project have a deliberate approach towards promoting effective exploitation of results? Yes/No

- If yes, what was your approach?

- If no, which were the reasons for not considering it?

Do your action's deliverables continue to address end users' needs (farmers, breeders, breeding companies, etc.). Yes/No

- If yes, please explain the type of user interest, e.g. animal feeding? Human food (quality, safety, special foods)? Industrial use (e.g. cosmetics)? Others?

- If no, please explain briefly (e.g. Have the needs already been addressed? Have the end users changed? etc.)"

7. Long term

Do you foresee a long-term added-value of your action beyond the time span of community co-funding? Yes/No

- If yes: which approach do/will you follow?

- If no, for which reasons?

Annex 6: Sample list of scientific publications from Actions co-funded under Council Regulation 870/200.

1. Microsatellite variability and genetic structure in hazelnut (Corylus avellana L.) cultivars from different growing regions; Roberto Botta and Paolo Boccacci Scientia Horticulturae 124 (2010) 128-133. (SAFENUT)
2. Impact of exogenous sucrose, raffinose and proline on cold acclimation of strawberry *in vitro* Lukoševiciute V., Rugienius R., Sasnauskas A., Stanys V., Bobinas C. Acta Horticulturae 2009. 839. P. 203-208. (GENEBERRY)
3. Zróżnicowanie cech morfologicznych zasobów genetycznych czosnku pospolitego (Allium sativum L.) nie tworzącego pędów kwiatostanowych [Variability of morphological traits of non-bolting garlic (Allium sativum L.) germplasm]. Kotlińska T. & M. Olas-Sochacka. 2010. Nowości Warzywnicze [Vegetable Crops News] 50: 45-62 (EURALLIVEG)
4. Further examination of antiradical properties of Crocus sativus stigmas extract rich in crocins. Ordoudi, S.A.; Nenadis N.; Tsimidou M.Z. (2009). Journal of Agricultural and Food Chemistry, 57, 3080-3086. (SAFFRON)
5. The Family of MADS-Box Transcription Factors Controlling Flower Formation in Crocus sativus L. Tsaftaris, A.S.; Pasentsis, K.; Kalivas, A.; Argiriou, A.; Polidoras, A. (2010). Acta Horticulturae, 850: 107-111. (SAFFRON)
6. Evaluation of DNA Polymorphism among Cultivated and Wild Grapevine Accessions from Azerbaijan. Salayeva S, Akhundova E, Mammadov A, 2010. Czech Journal of Genetics and Plant Breeding. 46, 2:75-84. (GRAPEGEN)
7. Plastid DNA sequence diversity in a worldwide set of grapevine cultivars (Vitis vinifera L. subsp. vinifera). Schaal B., Beck J., Hsu S.-C. , Beridze T., Gamkrelidze M., Gogniashvili M., Pipia I., Tabidze V., This P., Bacilieri R., Gotsiridze V., Glonti M., 2010. 10th International Conference on Grapevine Breeding and Genetics. Geneva, 1-5 August 2010. (GRAPEGEN)
8. Novel hydroxycinnamoyl-Coenzyme A quinate transferase genes from artichoke are involved in the synthesis of chlorogenic acid. Sonnante G., D'Amore R., Blanco E., Pierri C.L., De Palma M., Luo J., Tucci M., Martin C. 2010. Plant Physiology 153: 1-15.(CYNARES)
9. Taxonomic ecogeographic and genetic studies of *Prunus spp.* C Teeling 2011Ph.D thesis University of Birmingham (AEGRO)

Annex 7: Examples highlighting a potentially unclear demarcation between this Community Programme and the Rural Development policy.

Implementing the Global Plan of Action for Animal Genetic Resources (Irene Hoffmann and Beate Scherf Animal Genetic Resources, 2010, 47, 1–10. doi :10.1017/S2078633610001050 http://www.fao.org/docrep/013/i1823t/i1823t02.pdf) states *"Many European countries use the national allocation from the European Union Rural Development Programme (RDP) (Council Regulation 1698/2005) to support conservation of animal breeds within their jurisdiction. A survey undertaken by the United Kingdom, which covered 21 European countries, showed that only five of them do not have RDP measures for the support of AnGR".*

Another example is *Agri-environment Measures Overview on General Principles, Types of Measures, and Application (European Commission Directorate General for Agriculture and Rural Development Unit G-4 - Evaluation of Measures applied to Agriculture, Studies March 2005* http://ec.europa.eu/agriculture/publi/reports/agrienv/rep_en.pdf) where, discussing genetic diversity it states:

"These measures are often quite modest in size, but some nonetheless play a significant part in protecting rare breeds and rare plant varieties. Various examples are set out below.

In Portugal the number of endangered breeds represent about 10% of total livestock units. 11 breeds of cattle, 8 sheep, 3 goat and 2 pig breeds are supported by a specific agri - environmental measure. For cattle, the measure covers a significant proportion of national breeds.

In Germany there are a number of measures relating to the genetic diversity. For instance, in Niedersachsen nearly 7000 endangered animals are supported, of which over 1800 are on EU or international lists of endangered breeds. There is also support for rare plant varieties.

In Austria there has been a significant increase in support for rare breeds of livestock and plants in recent years. Farms protecting plant varieties increased to 1,300 in 2002, covering an area of over 6000 ha. The number of endangered animals supported is now over 18,000.

In Piemonte (IT) there is a significant programme covering several breeds of cattle, goats and sheep, and a total of over 39,000 animals. Low uptake seems to be a problem in several countries for these measures. For instance, in Navarra (ES) there are two animal breeds supported (1 cattle and 1 equine) but the performance of the scheme seems to be very weak (only a quarter of the programming target is likely to be reached by 2006).

In Wallonia (BE) there are two genetic diversity conservation agri-environment measures covering both crop varieties and animal breeds but low farmer interest means the success is very limited. In Luxembourg the measure for the conservation of local endangered breeds targets the Ardennes draught horse, but there were only 8 agreements and 29 animals in 2002.

In Ireland there are three animal species (2 cattle and 1 equine) on the FAO List of Endangered Species that are protected under agri-environment. However, interest in the measure seems on the decline (fewer than 80 animals currently)."

Furthermore, Council Regulation (EC) 74/2009 (amending Council Regulation (EC) 1698/2005) on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) provides agri-environmental payments for Conservation of genetic diversity and vocational training and information actions, for Information and dissemination of knowledge related to biodiversity with the potential effect of raising awareness and knowledge and thus indirectly the efficiency of operations related to biodiversity.

Annex 8: Acronyms, Abbreviations and Glossary

Here we provide a list of the abbreviations and acronyms, and a glossary of some terms that the reader is likely to encounter.

A - D

- AEGRO:- Project 057: Crop biodiversity in situ
- AGR Animal Genetic Resources
- AVEQ:- Project 061: Oats
- CAP:- The Common Agricultural Policy
- CBD:- Convention on Biological Diversity
- CGIAR:- Consultative Group on International Agricultural Research
- CROCUSBANK:- Project 018: Saffron
- CYNARES:- Project 063: Artichokes
- DAD-IS FAO Global Data Bank
- DNA:- Deoxyribonucleic acid
- DUS:- Distinct, Uniform and Stable
- EAAP:- European Federation of Animal Science
- EC (1.):- European Economic Community See EU, below
- EC (2.):- European Commission
- ECCDB:- European Central Crop Database
- ECPGR:- European Cooperative Programme for Plant Genetic Resources
- EFABIS:- Project 020: Farm animals
- ELBARN:- Project 066: Livestock breeds
- EPGRIS: - European Plant Genetic Resources Information Infra-Structure
- EU:- European Union
- EUFGIS:- Project 009: Forest
- EUFORGEN:- European Forest Genetic Resources Programme
- EURALLIVEG:- Project 050: Garlic and others
- EuReCa: - Project 012: Cattle
- EURIGEN: - Project 049: Rice
- EURISCO: - European Information System CO (a searchable catalogue of ex situ collections in Europe)

F - G

- FAO:- Food and Agriculture Organization of the United Nations
- FP, FP7:- The Community Framework Programmes of Research and Development GAP:- Global Action Plan See GPA (1) and GPA (2), below
- GENRES:- Genetic Resources for Agriculture
- GENBERRY:- Project 036: Straw- and raspberries
- GLOBALDIV:- Project 067: Livestock global view
- GPA (1):- Global plan of action for animal genetic resources
- GPA (2):- The Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture
- GRAPEGEN06:- Project 008: Grapevine
- GRIN:- Germplasm Resources Information Network

H - Q

- HERITAGESHEEP:- Project 040: Heritage sheep
- IPGRI:- International Plant Genetic Resources Institute - now known as Bioversity International
- IPR:- Intellectual Property Rights
- ITPGR:- International Treaty on Plant Genetic Resources for Food and Agriculture
- IUCN:- International Union for Conservation of wild species
- LEAFY VEG:- Project 001: Leafy vegetables
- MCPD Multicrop Passport Descriptors
- MTA:- See SMTA, below
- NGB:- Nordic Gene Bank
- NGO:- Non-governmental organization
- PGR Plant Genetic Resources

R - Z

- Rio Convention:- See CBD, above
- SAFENUT:- Project 068: Hazelnuts and almonds
- SMTA:- Standard Material Transfer Agreement
- SNP Single-nucleotide polymorphism
- SoWPGR-2 The second report on the state of the worlds plant genetic resources for food and agriculture (Rome, 2010) ISBN 978-92-5-106534-1
- USDA:- United States Department of Agriculture
- WTO:- World Trade Organization

Glossary

Accession: A sample of seeds of a given cultivar, a breeding line or a collected field sample which is held in a storage for conservation. The sample should contain sufficient seeds to (i) represent a significant proportion of genetic variation of the population from which it was derived, to (ii) provide material for germination tests to monitor viability and to (iii) provide seeds for distribution and regeneration.

Biodiversity: The totality of genes, species, and ecosystems in a given region, be it a microhabitat or the world. Also called biological diversity

Character: A hereditable trait such as size, colour, resistance to disease etc.

Characterisation: Assessment of plant traits that are highly heritable, easily seen by the eye, expressed in all environments, and usable for distinguishing between accessions.

Collection (of plant genetic resources):

- The act of gathering together domesticates (landraces, old and modern cultivars and breeding lines), also related wild or weedy species.
- The material gathered by the act of collecting, is termed a collection

Conservation: Preservation for future use of the collected material.

Cryopreservation: Conservation at ultra low temperatures

Database: An organized collection of data that can be used for easy retrieval or analysis.

DNA bank: A repository of highly purified genomic DNA (i.e. the DNA of the complete chromosome set).

In situ: Maintenance for study of organism in that organisms native environment.

In situ conservation : A conservation method that attempts to preserve the genetic integrity of gene resources by conserving them in the original habitat or natural environment. (cf. ex situ conservation, also "off-site conservation").

Ex-situ conservation:

- Keeping components of biodiversity alive outside their original habitat or natural environment.

Gene banks: see DNA bank.

Genetic diversity: The heritable variability of a given species, variety or breed.

On farm conservation: The conservation of a given variety or landrace usually by farmers growing as a crop (ather than by scientists). If conserved in the area of origin, the conservation is in-situ.

Stakeholder: A person, group, organization, member or system who affects or can be affected by an organization's actions.

Threatened species: A species that is likely to become extinct within the foreseeable future, throughout all or a significant portion of its range.

Wild relatives: A species related to a crop species that is not domesticated.