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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

CGRFA-15/15/Report

Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture

Rome, 19 – 23 January 2015

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REPORT OF THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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Rome, 2015

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Commission on Genetic Resources for Food and Agriculture
are to be found on the Internet at:
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I. OPENING OF THE SESSION

1. The Fifteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture (Commission) met in Rome, Italy, from 19 to 23 January 2015. The list of delegates and observers is available on the Commission's web site.

2. In accordance with its Rules of Procedure, the Commission had elected its Chair, Vice-Chairs and *Rapporteur* for the Fifteenth Regular Session at its Fourteenth Regular Session in 2013. The Chair of the Fifteenth Regular Session was Mr Amar Tahiri (Morocco). Mr Kailash C. Bansal (India), Ms Paula Rassi Brasil (Brazil), Ms Christine Dawson (United States of America), Ms Elzbieta Martyniuk (Poland), Mr Javad Mozafari Hashjin (Islamic Republic of Iran) and Mr William Wigmore (Cook Islands) were elected as Vice-Chairs. Ms Elzbieta Martyniuk was elected as *Rapporteur*. Ms Paula Rassi Brasil was replaced by Ms Clarissa della Nina (Brazil).

3. Mr Tahiri opened the session and welcomed delegates and observers.

4. Ms Maria Helena Semedo, Deputy Director-General, Coordinator Natural Resources, welcomed delegates and observers. She noted the presence of a significant number of international partner organizations, representing research institutes, farmers and others that continue to contribute to the work of the Commission, and in particular Mr Braulio Ferreira de Souza Dias, Executive Secretary of the Convention on Biological Diversity. She highlighted the work of the Commission over the past decades as a key driver in the development and implementation of important policies, guiding country-driven global assessments of genetic resources for food and agriculture, leading to increased awareness among policy-makers and the active pursuit of national policies. However, in spite of these considerable achievements, she stressed that greater efforts are needed to communicate and partner better to promote the implementation of policy and instruments, and to reach the public, particularly along the theme of the recent *Special Event on Food Security and Genetic Diversity*, that recognized the supremacy of food security and underlined that genetic diversity (and natural resources in general) is key to food security. Ms Semedo then briefly introduced the work to be covered during the session: the review of the draft *Second Report on the State of the World's Animal Genetic Resources*; discussion on the global assessments on aquatic genetic resources and *The State of the World's Biodiversity for Food and Agriculture*; guidelines to support the implementation of global action plans addressing plant, animal and forest genetic resources; a review of targets and indicators for genetic resources for food and agriculture; and cross-sectoral topics relevant to agriculture, forestry and fishery, such as the integration of genetic diversity into national climate change adaptation planning. She highlighted the importance of 2015, as marking the end of the Millennium Development Goals and the beginning of the post-2015 Sustainable Development Goals era.

5. Mr Braulio Ferreira de Souza Dias, Executive Secretary of the Convention on Biological Diversity, thanked the Commission for giving him the opportunity to address the Commission. He briefed the Commission on relevant activities under the Joint Work Plan 2011-2020 of the Convention on Biological Diversity and the Commission undertaken since the Commission's last regular session. Mr Dias reported on the mid-term review of progress towards the Aichi Biodiversity Targets and stressed the importance of various reviews under *The State of the World's Biodiversity for Food and Agriculture*, which were particularly important sources of information for assessing progress towards Aichi Biodiversity Target 13. He expressed his appreciation for the offer of FAO to take a lead role as Biodiversity Champion for Aichi Biodiversity Target 13. He pointed out that the Global Plans of Action for plant, animal and forest genetic resources continued to provide important frameworks for action and that the finalization of *The State of the World's Biodiversity for Food and Agriculture* would be critical to monitoring progress. Mr Dias also recalled collaboration of the two Secretariats on other issues, such as access and benefit-sharing; biodiversity, food, nutrition and health; and the post-2015 Sustainable Development Goals.

6. Ms Linda Collette, Secretary of the Commission, welcomed delegates and observers. She noted that the Commission had an obligation to ensure that genetic resources are not only conserved but that they contribute to achieving food security for present and future generations, and therefore that the Multi-Year Programme of Work should be implemented at international, regional, national

and local levels. Ms Collette recalled recent global events where the Commission's work on genetic resources and biodiversity for food and agriculture plays a key role: the formulation of the post-2015 Sustainable Development Goals for adoption in September 2015; the entry into force of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity in October 2014; and the advances made in negotiations on climate change leading to the Twenty-first Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change. She stressed that the Commission had an important role to play in these fora. She highlighted that the duty of the Commission is to ensure that all actors – policy-makers, consumers and the population at large – are informed on the merits and the need to invest in the conservation of genetic resources and agricultural biodiversity, as this is the way to progress. She noted that the discussions on cross-cutting issues such as access and benefit sharing, climate change, biotechnology, nutrition and biodiversity as well as the targets and indicators for biodiversity for food and agriculture would be of particular importance, in addition to recommendations for the development of the first report on *The State of the World's Biodiversity for Food and Agriculture* and the finalization of *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*. Ms Collette concluded by announcing that Tajikistan had now joined the Commission, bringing the total number of Members of the Commission to 178, and thanked the Governments of Spain and Germany for funding the participation of delegates from developing countries in this session. She also thanked the Governments of Spain, Norway, Sweden, Germany and Switzerland for their financial support for the implementation of the Multi-Year Programme of Work of the Commission.

7. The Chair reported on the inter-sessional activities of the Bureau since the Commission's last session. The Bureau had met twice during the inter-sessional period to consider, in particular, the provisional agenda for this session and to discuss the preparation as well as the meeting schedule of the sessions of the Commission's Working Groups and the Team of Technical and Legal Experts on Access and Benefit-sharing. The Bureau had also reviewed and welcomed the Implementation Plan for the Commission's Multi-Year Programme of Work 2014-2023. At its second – informal – meeting held on 18 January 2015, the Bureau had briefly considered ways to run the session in an effective and efficient manner.

8. Mr Wigmore (Cook Islands), Vice-Chair of the Commission, provided a brief summary of the conclusions of the *Special Event on Food Security and Genetic Diversity* that the Commission Secretariat had organized on 16 January 2015 and that was attended by more than 100 participants from a broad range of backgrounds. The participants recognized the role of genetic resources in improving nutrient content of food products. One of the key messages was the importance of integrating the nutritional aspects in crop and animal genetic improvements. He noted that the discussion of the contribution of genetic resources to food security comes at the right time given the global sustainable development agenda. He stressed that the issues are complex and require to be addressed using multistakeholder and inter-disciplinary approaches, which the Commission is well positioned to support. In addition, he mentioned that the development of a common narrative based on evidence, to support coherence and foster dialogue, was considered a necessary first step. He encouraged countries to reflect on this matter during the meeting.

9. The Commission adopted the Agenda as given in *Appendix A.*

II. *THE STATE OF THE WORLD'S BIODIVERSITY FOR FOOD AND AGRICULTURE*

10. The Commission considered the document *Status of preparation of The State of the World's Biodiversity for Food and Agriculture*.[1] It took note of the seminar held by the Secretariat on this topic on 17 January 2015. The Commission acknowledged the progress made in the preparation of *The State of the World's Biodiversity for Food and Agriculture*. It reiterated that the information is expected to be preliminary and incomplete in a number of areas and that assessing and highlighting these gaps will

[1] CGRFA-15/15/3.

be important. It recognized that data collection was challenging for countries and that, given the nature of data, caution should be exerted when compiling information from country reports and drawing conclusions.

11. The Commission thanked the countries that have submitted their country reports and invited the other countries to submit their country reports by 30 June 2015 and no later than 30 September 2015, with the understanding that the draft global report may not be completed fully when submitted to the Sixteenth Regular Session of the Commission. The Commission noted that a simplified reporting approach might be adopted by countries to allow them to complete their country reports on time. The Commission requested its Secretary to continue working towards the finalization of *The State of the World's Biodiversity for Food and Agriculture* and to submit a draft for consideration by the Commission at its next regular session, including a report reflecting upon the entire preparation process, subject to the availability of the necessary funding.

12. The Commission requested its Secretary to continue reporting on the status of preparation of the global report at relevant international meetings and ensure that it contributes to the global biodiversity agenda, in particular to the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. It invited countries to reflect findings from their country reports as well as any follow-up activities in their National Biodiversity Strategies and Action Plans. It invited stakeholders to continue submitting inputs.

13. The Commission called upon donors and relevant international organizations to make available extrabudgetary financial resources as well as in-kind support for the preparation of the global report, including for regional consultations and the preparation of country reports. It also requested FAO to provide technical support to countries, including through seminars and training.

III. TARGETS AND INDICATORS FOR BIODIVERSITY FOR FOOD AND AGRICULTURE

14. The Commission considered the document *Targets and indicators for biodiversity for food and agriculture*.[2] It welcomed the progress made in this area and the role of FAO in leading the development and use of international targets and indicators for biodiversity for food and agriculture.

15. The Commission encouraged FAO to continue its work to ensure consistency and coherence among the relevant fora and processes, also strengthening cooperation with other relevant institutions and processes in this area. It requested its Secretary to provide technical inputs to the work of the *Ad Hoc* Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020 and to continue engagement in the post-2015 UN development agenda.

16. The Commission requested FAO to continue updating the FAO/INFOODS Food Composition Database for Biodiversity and developing, testing and applying indicators for biodiversity for food and agriculture at the genetic level and, whenever relevant, at species and ecosystem levels. It further requested FAO to continue assisting countries already undertaking food consumption surveys to generate food consumption data for biodiversity on a regular basis. It noted the difficulties of collecting reliable data.

Targets and indicators for plant genetic resources for food and agriculture

17. The Commission considered the document *Targets and indicators for plant genetic resources for food and agriculture*.[3] It stressed the importance of higher-order composite indices as a synthetic measurement of progress in the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture and for communicating achievements towards the three targets for plant genetic resources for food and agriculture, including to the general public. It endorsed the model of higher-order composite indices for plant genetic resources for food and agriculture and requested FAO to continue working on and developing the higher-order composite indices.

[2] CGRFA-15/15/4.
[3] CGRFA-15/15/4.1.

18. It requested its Working Group on Plant Genetic Resources to continuously monitor and revise, if necessary, the application of the higher-order composite indices model based on data provided by Members as part of the monitoring of the Second Global Plan of Action. The Commission invited all countries that have not yet done so to nominate a National Focal Point for reporting on the implementation of the Second Global Plan of Action.

Targets and indicators for forest genetic resources

19. The Commission considered the document *Targets and indicators for forest genetic resources*.[4] It welcomed the progress made and recognized that more work is still needed to finalize the list of verifiable indicators for monitoring the implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources.[5]

20. The Commission requested FAO to continue the work on indicators for forest genetic resources, in consultation with the FAO Statistics Division, and to coordinate an inter-sessional consultative process with the participation of the Working Group on Forest Genetic Resources prior to its next meeting to further refine the list of verifiable indicators and to identify a set of targets for the conservation, sustainable use and development of forest genetic resources as well as a draft schedule for monitoring the implementation of the Global Plan of Action, for the consideration of the Working Group on Forest Genetic Resources and the Commission at their next sessions. Comments and suggestions were provided to be considered by the Secretariat in reviewing and revising the list of indicators.

IV. ACCESS AND BENEFIT-SHARING FOR GENETIC RESOURCES FOR FOOD AND AGRICULTURE

21. The Commission considered the document *Draft Elements to Facilitate Domestic Implementation of Access and Benefit-sharing for Different Subsectors of Genetic Resources for Food and Agriculture*[6] and took note of related information documents.[7] Mr Javad Mozafari Hashjin (Islamic Republic of Iran), Chair of the Team of Technical and Legal Experts on Access and Benefit-sharing (ABS Expert Team), introduced the reports of the ABS Expert Team.[8] The Commission thanked the Chair and the Members of the ABS Expert Team for their excellent work.

22. The Commission:

(i) welcomed the *Elements to Facilitate Domestic Implementation of Access and Benefit-sharing for Different Subsectors of Genetic Resources for Food and Agriculture* (ABS Elements), as given in *Appendix B* to the Report;

(ii) invited the Director-General to bring the ABS Elements to the attention of the Conference and to invite the Conference to welcome the ABS Elements;

(iii) requested the Secretary to develop, upon request from governments, materials for awareness-raising activities for use at national level with regard to access and benefit-sharing for different subsectors of genetic resources for food and agriculture, including on the importance of *ex situ, in situ* and on-farm conservation of genetic resources for food and agriculture, in collaboration with relevant partners and stakeholders, such as farmers and indigenous and local communities;

(iv) requested the Secretary to develop, with a view to enhancing cooperation between the environmental and agricultural sectors, targeted capacity-building and technical assistance activities at national level with regard to access and benefit-sharing for different subsectors of

[4] CGRFA-15/15/4.2.
[5] CGRFA-15/15/4.2, *Appendix I*.
[6] CGRFA-15/15/5.
[7] CGRFA-15/15/Inf. 10; CGRFA-15/15/Inf. 13; CGRFA-15/15/Inf. 13 Add.1; CGRFA-15/15/Inf. 14.
[8] CGRFA-15/15/Inf.11; CGRFA-15/15/Inf.12.

genetic resources for food and agriculture, in cooperation with relevant partners and stakeholders, such as farmers and indigenous and local communities;

(v) requested the Secretary to continue working with the Secretariats of the International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty) and the Convention on Biological Diversity (CBD) to ensure the former's active participation at appropriate meetings, including in capacity-building activities, organized by the Secretariats of the Treaty and the CBD to discuss the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD as well as the Treaty and to invite the Secretariats of the Treaty and the CBD to participate in appropriate meetings, including capacity-building activities, organized by the Commission's Secretariat to discuss access and benefit-sharing for genetic resources for food and agriculture;

(vi) invited Members to submit information on use and exchange practices, relevant voluntary codes of conduct, guidelines and best practices, and/or standards and community protocols on access and benefit-sharing specifically addressing genetic resources for food and agriculture and requested the Secretary to continue compiling this information, for consideration by the intergovernmental technical working groups and the Commission;

(vii) invited countries to consider and, as appropriate, make use of the ABS Elements and to provide feedback on their use, and requested the Secretary to compile a report on the national use of the ABS Elements;

(viii) requested the intergovernmental technical working groups to continue elaborating, with the assistance of the Secretary, subsector-specific ABS Elements including consideration of the role of traditional knowledge associated with genetic resources for food and agriculture and their customary use, and bearing in mind the on-going activities or processes under the Treaty, for consideration by the ABS Expert Team established by the Commission at its last session;

(ix) requested the ABS Expert Team to reconvene to consolidate the outputs of the meetings of the intergovernmental technical working groups and any additional information from thematic studies to be commissioned by the Secretary on sectors not covered by the working groups, and to report to the Commission at its next session; and

(x) requested the ABS Expert Team to work electronically and to meet once for three days, subject to the availability of the necessary funds.

V. BIODIVERSITY AND NUTRITION

23. The Commission considered the document *Biodiversity and nutrition*[9] and reiterated the importance of biodiversity for food security and nutrition, including the prevention and treatment of malnutrition. It highlighted the relevance of biodiversity for nutrition with the outcomes of the Second International Conference on Nutrition, such as recommendations 8, 10, 19, 20, 21 and 42 of the Framework for Action.[10]

24 The Commission endorsed the *Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition*, as presented in *Appendix C*. The Voluntary Guidelines provide examples of how mainstreaming could be implemented depending on each country's needs and capabilities, as appropriate. The Commission stressed that the implementation should be based on scientific evidence and consistent with relevant international obligations.

25. The Commission encouraged governments and stakeholders to implement the Voluntary Guidelines, where appropriate. It called upon them to support research on the nutrient composition of foods derived from different varieties of plants and breeds of animals, as well as of wild, neglected

[9] CGRFA-15/15/6.
[10] ICN2 2014/3 Corr.1.

and underutilized species. It requested FAO to report on the implementation of the Voluntary Guidelines at its Seventeenth Regular Session.

26. The Commission requested FAO to publish the Voluntary Guidelines and, subject to the availability of the necessary funds, provide support to their implementation, including capacity development, and continue improving the scientific evidence base for biodiversity and nutrition and exploring the possibility of new indicators such as nutrient productivity.

VI. APPLICATION AND INTEGRATION OF BIOTECHNOLOGIES FOR THE CONSERVATION AND SUSTAINABLE UTILIZATION OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE

27. The Commission considered the document *Application and integration of biotechnologies for the conservation and sustainable utilization of genetic resources for food and agriculture.*[11]

28. The Commission requested that FAO continue to strengthen the national and regional capacities of developing countries to develop appropriate biotechnologies for the characterization, conservation and utilization of genetic resources for food and agriculture, taking into consideration relevant national and regional laws and regulations, and international instruments including those related to risk assessment.

29. The Commission requested that FAO continue its activities for the regular dissemination of updated factual information on the role of biotechnologies for the characterization, conservation and utilization of genetic resources for food and agriculture through its existing databases, networks and newsletters, also emphasizing communication of biotechnology developments to the public.

30. The Commission requested that FAO continue assessing trends and progress of applications of biotechnologies in the characterization, conservation and utilization of genetic resources for food and agriculture by compiling existing information, as needed, in line with the review of work on biotechnologies for the characterization, conservation and utilization of genetic resources for food and agriculture in the 2014-2023 Multi-Year Programme of Work (MYPOW).

31. The Commission requested that FAO continue to explore mechanisms for future cooperation with relevant international organizations, including for fostering North-South, South-South and triangular cooperation in applying appropriate biotechnologies for the characterization, conservation and utilization of genetic resources for food and agriculture.

32. The Commission recognized that its Members may wish to undertake socioeconomic analyses of biotechnology applications where appropriate in the characterization, conservation and utilization of genetic resources for food and agriculture.

VII. CLIMATE CHANGE AND GENETIC RESOURCES FOR FOOD AND AGRICULTURE

33. The Commission considered the document *Genetic resources for food and agriculture and climate change*[12] and took note of the related information documents.[13]

34. The Commission endorsed the *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning*, as given in *Appendix D*, and invited the Director-General to bring them to the attention of the Conference for approval at its forthcoming session and to invite the Conference to call upon countries to implement the Voluntary Guidelines. It invited the Secretary of the Commission to officially transmit the Voluntary Guidelines, as adopted by the Conference, to the United Nations Framework Convention on Climate Change (UNFCCC) and other relevant international instruments and bodies.

[11] CGRFA-15/15/7.
[12] CGRFA-15/15/8.
[13] CGRFA-15/15/Inf.15; CGRFA-15/15/Inf.16.

35. The Commission approved the proposed revision to its Programme of Work on Climate Change and Genetic Resources for the period of 2015 to 2016[14] and noted that its implementation should not prejudice the negotiations under the UNFCCC.

VIII. ANIMAL GENETIC RESOURCES

Report of the Eighth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture

36. The Commission considered the *Report of the Eighth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture*.[15] Mr Drago Kompan (Slovenia), Vice-Chair of the Working Group on Animal Genetic Resources, introduced the report. The Commission thanked the Bureau and the Members of the Working Group on Animal Genetic Resources for their excellent work. It endorsed the report.

The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture

37. The Commission considered the document *Preparation of The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*[16] and took note of the related information documents.[17]

38. The Commission welcomed the draft *Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture* as a comprehensive, timely and high-quality document. It requested FAO to make the revised draft Second Report available by 31 March 2015 and invited comments from Members and observers by 31 May 2015 on this revised draft Second Report. It further requested FAO to finalize the Second Report, taking into account comments received, and to publish it also as an in-brief version in all languages of FAO, subject to the availability of the necessary funds, before the end of 2015. The Commission called upon governments and donors to make available the financial resources necessary to translate, publish, print and distribute the Second Report and its in-brief version.

Implementation and updating of the Global Plan of Action for Animal Genetic Resources

39. The Commission considered the document *Implementation and updating of the Global Plan of Action for Animal Genetic Resources*[18] and took note of other relevant information.[19] It welcomed the progress made in the implementation of the Global Plan of Action for Animal Genetic Resources and called upon countries to continue implementing it in order to contribute to global food security and sustainable rural development and in particular to contribute to the process of the post-2015 UN development agenda. The Commission requested FAO to continue supporting country implementation of the Global Plan of Action.

40. The Commission endorsed the *Guidelines for the Development of Integrated Multipurpose Animal Recording Systems*[20] and requested FAO to publish and distribute them.

41. The Commission stressed the need for countries to regularly update their official national breed data in FAO's Domestic Animal Diversity Information System (DAD-IS), or any other information system that automatically shares data with DAD-IS, and to provide information on breed classifications. It requested FAO to investigate options for obtaining data on the size of unspecified species populations, in order to facilitate the calculation of Indicator 2 on the proportion of the total

[14] CGRFA-15/15/8, *Appendix II.*
[15] CGRFA-15/15/9.
[16] CGRFA-15/15/10.
[17] CGRFA-15/15/Inf.17.1; CGRFA-15/15/Inf.17.2; CGRFA-15/15/Inf.17.3.
[18] CGRFA-15/15/11.
[19] CGRFA-15/15/Inf.18; CGRFA-15/15/Inf.19; CGRFA-15/15/Inf.20; Background Study Paper No. 66.
[20] CGRFA-15/15/Inf.20.

species population accounted for by locally adapted and exotic breeds.[21] The Commission stressed the importance of DAD-IS as the international clearing house mechanism for information on animal genetic resources, urged FAO to ensure long-term support for DAD-IS maintenance from the regular programme and invited donors to provide *ad hoc* support to enable the development of DAD-IS, as necessary.

42. The Commission reviewed the administrative costs of the Funding Strategy for the Implementation of the Global Plan of Action for Animal Genetic Resources[22] and agreed to consider, at its next session, an increase of the maximum budget per national project for future calls for proposals. It invited donors to contribute to the implementation of the Global Plan of Action for Animal Genetic Resources, including through contributions to the Multidonor Trust Fund Programme.

43. The Commission agreed to the two-step approach recommended by the Working Group on Animal Genetic Resources for the review of the Global Plan of Action for Animal Genetic Resources[23] and requested FAO to facilitate this process.

IX. FOREST GENETIC RESOURCES

Report of the Third Session of the Intergovernmental Technical Working Group on Forest Genetic Resources

44. The Commission considered the *Report of the Third Session of the Intergovernmental Technical Working Group on Forest Genetic Resources*.[24] Mr Pierre Bouillon (France), Chair of the Working Group on Forest Genetic Resources, introduced the report. The Commission thanked the Bureau and the Members of the Working Group on Forest Genetic Resources for their excellent work. It endorsed the report and requested FAO to make country reports and thematic studies produced during the preparation of *The State of the World's Forest Genetic Resources,* available on the FAO web site.

Follow-up to the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources

45. The Commission considered the document *Draft Strategy for the Implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources*[25] and adopted the Strategy, as given in *Appendix E*.

46. The Commission called upon countries to implement the *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* and to assist others in this endeavour. It stressed that the Strategy is fundamental for achieving the goals of the Global Plan of Action and called for the implementation of the Strategy in coordination with the Committee on Forestry and relevant international organizations. The Commission requested FAO to assist in the mobilization of funds and appealed to donors to make funding available.

47. The Commission acknowledged the importance of REFORGEN as a knowledge-sharing platform on forest genetic resources and requested FAO to continue developing and updating it in coordination with relevant databases.

48. The Commission further requested FAO to continue integrating forest genetic resources within its forestry programme and requested its Secretary to report to the Commission on this matter.

[21] See CGRFA-15/15/11, paragraph 15.
[22] CGRFA-12/09/Report, *Appendix C*.
[23] See CGRFA-15/15/9, paragraph 16.
[24] CGRFA-15/15/12.
[25] CGRFA-15/15/13.

X. PLANT GENETIC RESOURCES

Report of the Seventh Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture

49. The Commission considered the *Report of the Seventh Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture*.[26] Mr Luis Salaices Sánchez (Spain), Chair of the Working Group on Plant Genetic Resources, introduced the report. The Commission thanked the Bureau and the Members of the Working Group on Plant Genetic Resources for their excellent work. It endorsed the report.

Review of the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture

50. The Commission considered the document *Implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture*[27] and took note of relevant information documents, including the *Reporting Format for Monitoring the Implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture*.[28] It agreed that its work on plant genetic resources should be carried out in cooperation with relevant international instruments, especially the Treaty, and organizations, avoiding duplication of their work.

51. The Commission invited its Working Group to review and revise the two draft technical guidelines, *National level conservation and use of landraces*[29] and *National level conservation of crop wild relatives,*[30] considering inputs received from Members and stakeholders, such as smallholders and indigenous peoples and local communities. The Commission took note of the revised concept note *Global networking on in situ conservation and on-farm management of plant genetic resources for food and agriculture*.[31] It requested FAO to convene before the next session of the Working Group, subject to availability of extrabudgetary funds, an informal multistakeholder dialogue to discuss options for networking for *in situ* conservation and on-farm management, its functions, governance and budgetary requirements, in particular to ensure its long-term funding. The Commission requested FAO to revise the concept note in the light of the outcomes of the multistakeholder dialogue, for consideration of the Commission at its next session. The Commission stressed the complementarity of different conservation approaches and the need to balance them and requested FAO to continue supporting countries in the implementation of the voluntary *Genebank Standards for Plant Genetic Resources for Food and Agriculture*[32] and propose a mechanism to monitor their application.

52. The Commission endorsed the *Voluntary Guide for National Seed Policy Formulation.*[33] The Commission agreed that nothing in this Voluntary Guide should be interpreted to aim at limiting any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate. When using the Voluntary Guide, countries are invited to take into account gender equality and women's empowerment and, as appropriate, the important role of customary use of landraces. The Commission requested FAO to continue its work on strengthening national seed systems.

53. The Commission reaffirmed the need for technical support in the area of crop improvement and for plant breeding capacity and seed systems' development in support of the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture and the Treaty, taking into account the work of the Treaty. It called for extrabudgetary funds to maximize

[26] CGRFA-15/15/14.
[27] CGRFA-15/15/15.
[28] CGRFA-15/15/Inf.21; CGRFA-15/15/Inf.22; CGRFA-15/15/Inf.23; CGRFA-15/15/Inf.24; CGRFA-15/15/Inf.9; CGRFA-15/15/Inf.25.
[29] CGRFA-15/15/Inf.23.
[30] CGRFA-15/15/Inf.24.
[31] CGRFA-15/15/Inf.22.
[32] CGRFA-14/13/22; see also http://www.fao.org/3/a-i3704e.pdf.
[33] CGRFA-15/15/Inf.25.

country participation in plant breeding activities, including in support of the Global Partnership Initiative for Plant Breeding and Capacity Building and for continued support to the Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture.

54. The Commission endorsed as a voluntary reference tool the *Guidelines for Developing a National Strategy for Plant Genetic Resources for Food and Agriculture*.[34] It called upon donors for extrabudgetary funds to support countries in the development of national strategies for the conservation and sustainable use of plant genetic resources for food and agriculture.

Preparation of *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*

55. The Commission considered the document *Preparation of The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*.[35]

56. The Commission reviewed and endorsed the timeline for *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*,[36] and took note of the provisional budget.[37] It endorsed the outline, as given in *Appendix F*. The Commission welcomed the full integration of the preparation of the Third Report with the monitoring process for the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture. It recommended reviewing the list of thematic studies[38] following the assessment of the implementation of the Second Global Plan of Action at its next regular session. The Commission welcomed the upgrading of the computer application for the National Information Sharing Mechanism (NISM) and its full integration with the World Information and Early Warning System (WIEWS), which will facilitate reporting on the implementation of the Second Global Plan of Action.

57. The Commission invited donors to provide extrabudgetary resources to support the monitoring of the Second Global Plan of Action and the preparation of the Third Report, including through NISM.

58. The Commission invited all Members that have not yet done so to nominate a National Focal Point for the monitoring of the Second Global Plan of Action and the preparation of country reports for the Third Report. The Commission requested FAO to make available the guidelines for country report preparation, on time.

XI. AQUATIC GENETIC RESOURCES

Status of preparation of *The State of the World's Aquatic Genetic Resources for Food and Agriculture*

59. The Commission considered the document *Status of preparation of The State of the World's Aquatic Genetic Resources for Food and Agriculture*[39] and took note of the relevant information document.[40]

60. The Commission requested FAO to continue preparing *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. The Commission endorsed the timeline for the preparation of the report,[41] the indicative list of thematic background studies[42] and cost estimates.[43] The Commission requested FAO to also consider information contained in country reports prepared for *The State of the World's Biodiversity for Food and Agriculture*. The Commission noted the need to

[34] CGRFA-15/15/Inf.21.
[35] CGRFA-15/15/16.
[36] CGRFA-15/15/16, *Appendix I*.
[37] CGRFA-15/15/16, *AppendixII*.
[38] CGRFA-15/15/16, *Appendix IV*.
[39] CGRFA-15/15/17.
[40] CGRFA-15/15/Inf.27.
[41] CGRFA-15/15/17, *Appendix II*.
[42] CGRFA-15/15/17, *Appendix I*.
[43] CGRFA-15/15/17, *Appendix III*.

strengthen existing information systems and requested FAO to identify opportunities to strengthen them at the regional and global levels.

61. The Commission invited countries to prepare country reports for *The State of the World's Aquatic Genetic Resources for Food and Agriculture* with the involvement of all relevant stakeholders. It noted that some countries need technical and financial assistance in order to prepare their reports and invited donors to contribute. The Commission noted that follow-up activities to *The State of the World's Aquatic Genetic Resources for Food and Agriculture* could include the development of elements related to the Code of Conduct for Responsible Fisheries.

62. The Commission invited relevant international and regional organizations with a recognized mandate and competence to contribute to the preparation of the report, including through providing reports to FAO.

Establishment of the *Ad Hoc* Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture

63. The Commission considered the document *Establishment of an Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture*.[44] In order to facilitate the preparation of *The State of the World's Aquatic Genetic Resources for Food and Agriculture*, the Commission agreed to establish the *Ad Hoc* Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture specifically with the task to guide the preparation of and review the report. The Commission adopted the Statutes as presented in *Appendix G* and elected the Members of the *Ad Hoc* Working Group, as given in *Appendix I*. The Commission will consider, at its next session, whether this Working Group shall continue to exist.

64. The Commission requested its Secretary to ensure complementarity between the FAO Committee on Fisheries (COFI) and the Commission, especially with regard to aquatic genetic resources. This will include improved communications whereby the decisions of the Commission are shared with COFI and its Sub-Committee on Aquaculture.

65. The Commission reiterated the importance of inviting the COFI Advisory Working Group on Aquatic Genetic Resources and Technologies, when convened, to contribute to the preparation of *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. The Commission requested to be informed, through its Bureau, about the contributions of the COFI Advisory Working Group on Aquatic Genetic Resources and Technologies.

XII. MICRO-ORGANISMS AND INVERTEBRATES

66. The Commission considered the document *Review of work on micro-organisms and invertebrates*[45] and took note of the related information document.[46] The Commission reiterated the importance of microbial and invertebrate diversity, including the role of pollinators, for sustainable agriculture and for food security and nutrition. It also noted that bacterial, yeast and fungal genetic resources used in food processing need to be included in the future work of the Commission.

67. The Commission emphasized the need for the preparation process of the report on *The State of the World's Biodiversity for Food and Agriculture* to address issues related to micro-organisms and invertebrates and appealed to all FAO Members to provide relevant information in the course of the preparation of the report.

68. The Commission called for technical and financial support for countries to carry out further work on the characterization, conservation and sustainable use of micro-organisms and invertebrates, including through the establishment of culture collections, subject to the availability of the necessary funds.

[44] CGRFA-15/15/18
[45] CGRFA-15/15/19.
[46] CGRFA-15/15/Inf.28.

69. The Commission requested FAO to review the planning of its work on the conservation and sustainable use of micro-organisms and invertebrates following the presentation to the Commission of *The State of the World's Biodiversity for Food and Agriculture*, preferably at its Sixteenth Regular Session.

XIII. IMPLEMENTATION OF THE MULTI-YEAR PROGRAMME OF WORK

70. The Commission considered the document *Implementation of the Multi-Year Programme of Work*[47] and took note of the relevant information document.[48]

71. The Commission welcomed the alignment of the MYPOW to the FAO Reviewed Strategic Framework[49] and recognized that genetic resources provide a key contribution to all FAO Strategic Objectives, in particular Strategic Objective 2: Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner.

72. The Commission acknowledged the support of donor countries and FAO to the implementation of the MYPOW and invited donors to continue providing extrabudgetary resources to support the implementation of the MYPOW and the participation of developing countries in relevant meetings.

73. The Commission requested its Secretary to explore options to help attracting funds and increase efficiency, including the establishment of a trust fund for genetic resources for food and agriculture, for consideration of the Commission at its next regular session. It further stressed the importance of building on the lessons learned from the sectors.

74. In the follow-up to the *Special Event on Food Security and Genetic Diversity*, the Commission requested its Secretary to continue raising awareness of the important role of genetic resources for food security. It requested its Secretary to identify options for specific activities in this regard, for consideration of the Commission at its next session when it would review its MYPOW. It further invited its Secretary to strengthen collaboration with the Committee on World Food Security in this endeavour.

75. The Commission requested its Bureau to make adjustments to the *Implementation Plan for the Commission's Multi-Year Programme of Work (2014-2023) - Annex to the Strategic Plan 2014-2023,*[50] reflecting the outcome of this session.

76. The Commission further considered the document *National Focal Points to the Commission on Genetic Resources for Food and Agriculture*.[51] It acknowledged the key role of sectoral focal points in the work of the Commission, invited Members to nominate National Focal Points to the Commission on the basis of the terms of reference provided in *Appendix H* and requested the Secretary to publish them on the Commission's web site.

XIV. COOPERATION WITH INTERNATIONAL INSTRUMENTS AND ORGANIZATIONS

77. The Commission considered the document *Cooperation with international instruments and organizations*.[52]

78. The Commission took note of the submissions and inputs on the prioritized themes of the session received from international instruments and organizations[53] and thanked them for their

[47] CGRFA-15/15/20.1.
[48] CGRFA-15/15/Inf.29.
[49] C 2013/7.
[50] CGRFA-15/15/Inf.29.
[51] CGRFA-15/15/20.2.
[52] CGRFA-15/15/21.
[53] CGRFA-15/15/Inf.8; CGRFA-15/15/Inf.26; CGRFA-15/15/Inf.30; CGRFA-15/15/Inf.31; CGRFA-15/15/Inf.32.

contributions and for providing inputs to the work of the Commission. The Commission requested the Secretary to continue strengthening cooperation with the biodiversity-related conventions and instruments, including the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services in their respective areas of competence.

79. The Commission requested its Secretary to continue seeking inputs on the prioritized themes of the session from international instruments and organizations and making them available to the Commission for its information.

80. The Commission requested its Secretary to continue strengthening collaboration with the Secretary of the Treaty to promote coherence in the development and implementation of the respective programmes of work of the two bodies. It recalled that, at its last session, there was no consensus among its Members on the transfer of tasks or activities and agreed to keep the matter under review. The Commission took note of Resolution 4/2013 adopted by the Governing Body of the Treaty at its Fifth Session and requested its Secretary to provide, in collaboration with the Secretary of the Treaty, additional information, particularly in respect of financial and administrative implications, that is necessary for an informed discussion on the transfer of tasks and activities, to the next sessions of the Governing Body of the Treaty and the Commission.

XV. STATUS OF OBSERVERS

81. The Commission considered the document *Recent developments with regard to observers attending meetings of FAO*[54] and took note that this issue is currently being reviewed by the Council of FAO.

XVI. COMPOSITION AND ELECTION OF MEMBERS OF THE INTERGOVERNMENTAL TECHNICAL WORKING GROUPS ON ANIMAL, FOREST AND PLANT GENETIC RESOURCES

82. The Commission considered the document *The composition of the Commission's Intergovernmental Technical Sectoral Working Groups and the participation of observers/alternates*.[55]

83. The Commission took note of the information provided on the composition of its Intergovernmental Technical Working Groups on Animal, Forest and Plant Genetic Resources and on the issue of the attendance of observers and alternates at sessions of the intergovernmental technical working groups.

84. The Commission agreed to amend the statutes of the already operating Intergovernmental Technical Working Groups on Animal, Forest and Plant Genetic Resources by changing the number of seats of the Near East Region from 3 to 4 in each of the intergovernmental technical working groups. This decision is without prejudice to the composition of any other body of FAO. The Commission also agreed to close this agenda item and agreed that any future discussion regarding the composition of the working groups should be undertaken only if the whole methodology/criteria for the composition is to be considered.

85. The Commission amended Article III of the Statutes of the Intergovernmental Technical Working Groups on Animal, Forest and Plant Genetic Resources as follows (amended text in italics and underlined):

> Article III – Election and term of office of Members *and Alternate Members*
>
> 1. The Members of the Working Group shall be elected at each regular session of the Commission and serve until the next regular session of the Commission. *In addition, the Commission shall elect at each regular session a list of up to two Alternate Members for each region. Alternate Members will replace, in the order in which they*

[54] CGRFA-15/15/22.
[55] CGRFA-15/15/23.

appear on the list, any Member who has resigned and informed the Secretariat accordingly.

(ii) The elected Members *and Alternate Members* will be eligible for re-election.

(iii) *Members are requested to confirm their participation to the Working Group meeting. If a Member of the Working Group is not able to attend the meeting, and informs the Secretariat accordingly, the Member shall be replaced in a timely manner by one of the elected Alternates from the same region.*

(iv) *In case a Member of the Working Group does not attend the meeting, the Working Group, in consultation with the region, may replace this Member, on an ad hoc basis, by a Member of the Commission from the same region that is present at the meeting.*

86. The Commission elected the Members of its Intergovernmental Technical Working Groups on Animal, Forest and Plant Genetic Resources, as given in *Appendix I*, and requested them to meet before the next regular session of the Commission.

XVII. DATE AND PLACE OF THE COMMISSION'S SIXTEENTH REGULAR SESSION

87. The Commission agreed that its Sixteenth Regular Session would be convened in Rome, Italy, in 2017, at a suitable date before the Fortieth Session of the Conference. Taking this into account, the Secretary indicated as a tentative date for the Commission's Sixteenth Regular Session the dates of 30 January to 3 February 2017.

XVIII. ELECTION OF THE CHAIR, VICE-CHAIRS AND *RAPPORTEUR*

88. The Commission elected its Chair and Vice-Chairs for its Sixteenth Regular Session. Mr Chang-Yeon Cho (Republic of Korea) was elected as Chair. Ms Clarissa della Nina (Brazil), Mr Charles Nying (Cameroon), Mr William Wigmore (Cook Islands), Mr Javad Mozafari Hashjin (Islamic Republic of Iran), Mr François Pythoud (Switzerland) and Ms Christine Dawson (United States of America) were elected as Vice-Chairs. Ms Clarissa della Nina was elected *Rapporteur*.

XIX. CLOSING STATEMENTS

89. Regional representatives took the floor to thank the Chair, the Bureau, delegates, the Secretariat and the support staff and to express their satisfaction with the outcomes of the meeting. Thanks were also expressed to the governments that had provided financial assistance to support the attendance of delegates from developing countries.

90. A representative of the International Planning Committee for Food Sovereignty, on behalf of civil society organizations present at this session of the Commission, noted the important role of the Commission in providing overarching governance for all biodiversity for food and agriculture. He welcomed the forthcoming preparation of *The State of the World's Biodiversity for Food and Agriculture* and emphasized the importance of involving small-scale producers from all subsectors in the process and of ensuring that their views and perspectives were included.

91. Ms Collette, Secretary of the Commission, reflected on the outcomes of the meeting, noting that the Commission had once again proved to be an essential intergovernmental forum and that its decisions would help to position genetic resources at the core of global agendas. Ms Collette also noted that the success of the Commission's future work would depend upon collaboration with a wide range of stakeholders. She thanked the Chair and the Bureau for their work during the meeting and the inter-sessional period and all the delegates and observers for their contributions to the success of the meeting. She also expressed her gratitude to all the staff.

92. Mr Tahiri, the Chair, thanked the Commission Secretariat and FAO's technical departments, along with the interpreters and other support staff. He also thanked the Vice-Chairs and the *Rapporteur* and extended his best wishes to the incoming Chair and Bureau. Finally, he thanked delegates for their hard work, spirit, clarity and willingness to compromise.

APPENDIX A

AGENDA OF THE FIFTEENTH REGULAR SESSION OF THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

1. Adoption of the agenda and time-table

MULTI-YEAR PROGRAMME OF WORK

2. Cross-sectorial matters
   - 2.1 *The State of the World's Biodiversity for Food and Agriculture*
   - 2.2 Targets and indicators for biodiversity for food and agriculture
   - 2.3 Access and benefit-sharing for genetic resources for food and agriculture
   - 2.4 Biodiversity and nutrition
   - 2.5 Application and integration of biotechnologies for the conservation and sustainable utilization of genetic resources for food and agriculture
   - 2.6 Climate change and genetic resources for food and agriculture

3. Animal genetic resources
   - 3.1 Report of the Eighth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture
   - 3.2 *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*
   - 3.3 Implementation and updating of the Global Plan of Action for Animal Genetic Resources

4. Forest genetic resources
   - 4.1 Report of the Third Session of the Intergovernmental Technical Working Group on Forest Genetic Resources
   - 4.2 Follow-up to the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources

5. Plant genetic resources
   - 5.1 Report of the Seventh Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture
   - 5.2 Review of the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture
   - 5.3 Preparation of *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*

6. Aquatic genetic resources

7. Micro-organisms and invertebrates

8. Implementation of the Multi-Year Programme of Work

COOPERATION WITH INTERNATIONAL INSTRUMENTS AND ORGANIZATIONS

9. Cooperation with international instruments and organizations

THE COMMISSION'S MODE OF OPERATION

10. Status of the Commission

11. Composition of intergovernmental technical working groups

OTHER MATTERS

12. Other business

13. Date and place of the Commission's Sixteenth Regular Session

14. Election of Chair and Vice-Chairs

15. Adoption of the Report

APPENDIX B

ELEMENTS TO FACILITATE DOMESTIC IMPLEMENTATION OF ACCESS AND BENEFIT-SHARING FOR DIFFERENT SUBSECTORS OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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I. BACKGROUND

Access and benefit-sharing and the Commission

1. The Food and Agriculture Organization of the United Nations (FAO) and its Commission on Genetic Resources for Food and Agriculture (Commission) have a longstanding history of dealing with issues related to genetic resources for food and agriculture (GRFA), including access to them and the fair and equitable sharing of benefits derived from their utilization. In 1983, the FAO Conference adopted the *International Undertaking on Plant Genetic Resources for Food and Agriculture*, which provided a policy and planning framework for the Commission with respect to plant genetic resources for food and agriculture (PGRFA). During the following years, the Commission negotiated further resolutions that interpreted the International Undertaking, and in 1994, started revising the International Undertaking. As a result of this process, the FAO Conference in 2001 adopted the *International Treaty on Plant Genetic Resources for Food and Agriculture* (Treaty), the first legally binding and operational international instrument on access and benefit-sharing (ABS) for genetic resources.

Convention on Biological Diversity

2. The *Convention on Biological Diversity* (CBD), adopted in 1992, is the first international agreement that addresses ABS in its objectives and provisions. It recognizes the sovereign rights of States over their natural resources and affirms the authority governments have, subject to their national legislation, to determine access to genetic resources.

The Nagoya Protocol

3. The *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity* (Nagoya Protocol) is a supplementary agreement to the CBD. It provides a legal framework for the effective implementation of the third objective of the CBD, the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources, with a view to contributing to the conservation of biological diversity and the sustainable use of its components, the other two objectives of the CBD.

International Regime

4. As recognized by the Conference of the Parties of the CBD at its tenth meeting, the International Regime of ABS is constituted by the CBD, the Nagoya Protocol as well as complementary instruments, including the Treaty and the *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*.[1]

Special features of GRFA

5. The special nature of GRFA, which are included in agricultural biodiversity, its distinctive features and problems needing distinctive solutions, is widely acknowledged. The Conference of the Parties to the CBD, at its fifth meeting in 2000, considered the distinctive features of agricultural biodiversity to include the following:

(a) Agricultural biodiversity is essential to satisfy basic human needs for food and livelihood security;
(b) Agricultural biodiversity is managed by farmers; many components of agricultural biodiversity depend on this human influence; indigenous knowledge and culture are integral parts of the management of agricultural biodiversity;
(c) There is a great interdependence between countries for the genetic resources for food and agriculture;
(d) For crops and domestic animals, diversity within species is at least as important as diversity between species and has been greatly expanded through agriculture;

[1] COP 10 Decision X/1.

(e) Because of the degree of human management of agricultural biodiversity, its conservation in production systems is inherently linked to sustainable use;
(f) Nonetheless, much biological diversity is now conserved ex situ *in gene banks or breeders' materials;*
(g) The interaction between the environment, genetic resources and management practices that occurs in situ *within agro-ecosystems often contributes to maintaining a dynamic portfolio of agricultural biodiversity.*[2]

6. The Commission considered the distinctive features of GRFA, which are given in the *Annex* to this document. These features provide information on the characteristics of the different subsectors of GRFA. [3] It should be noted that the Commission acknowledged the need to further refine this list of distinctive features and to focus on the utilization of GRFA.

The Nagoya Protocol and GRFA

7. The Nagoya Protocol, in its preamble, explicitly recognizes the importance of genetic resources to food security, the special nature of agricultural biodiversity, its distinctive features and problems needing distinctive solutions, as well as the interdependence of all countries with regard to GRFA and the special nature and importance of these resources for achieving food security worldwide and for sustainable development of agriculture in the context of poverty alleviation and climate change. In this regard, the Nagoya Protocol also acknowledges the fundamental role of the Treaty and the Commission.

8. In its operational provisions, the Nagoya Protocol requires Parties to consider, in the development and implementation of their ABS legislation or regulatory requirements, the importance of GRFA and their special role for food security.[4] Parties shall also create conditions to promote and encourage research which contributes to the conservation and sustainable use of biological diversity, particularly in developing countries, including through simplified measures on access for non-commercial research purposes, taking into account the need to address a change of intent for such research.[5]

9. The Nagoya Protocol leaves room for other international agreements in the field of ABS and it does not prevent its Parties from developing and implementing other relevant international agreements, including other specialized ABS agreements, provided that they are supportive of and do not run counter to the objectives of the CBD and the Nagoya Protocol.[6] Where a specialized international ABS instrument that is consistent with and does not run counter to the objectives of the CBD and the Nagoya Protocol applies, the Nagoya Protocol does not apply for the Party or Parties to the specialized instrument in respect of the specific genetic resource covered by and for the purpose of the specialized instrument.[7] One of the instruments explicitly acknowledged in the Preamble of the Nagoya Protocol is the Treaty which has been developed in harmony with the CBD. Beyond this openness to other international instruments, the Nagoya Protocol also states that due regard should be paid to "useful and relevant ongoing work or practices under such international instruments and relevant international organizations, provided that they are supportive of and do not run counter to the objectives of the CBD and this Protocol."[8]

10. The Nagoya Protocol also requires Parties to encourage, as appropriate, the development, update and use of sectoral and cross-sectoral model contractual clauses for mutually agreed terms

[2] COP 5 Decision V/5, *Appendix*, paragraph 2.
[3] Throughout this document, unless otherwise specified, "subsectors of GRFA" and "subsectors" are understood as to mean the subsectors of (1) plant genetic resources for food and agriculture; (2) animal genetic resources for food and agriculture; (3) forest genetic resources for food and agriculture; (4) aquatic genetic resources for food and agriculture and; (5) micro-organism genetic resources for food and agriculture; and (6) invertebrate genetic resources for food and agriculture.
[4] Nagoya Protocol, Article 8(c).
[5] Nagoya Protocol, Article 8(a).
[6] Nagoya Protocol, Article 4.2.
[7] Nagoya Protocol, Article 4.4.
[8] Nagoya Protocol, Article 4.3.

(MAT) and of voluntary codes of conduct, guidelines and best practices and/or standards in relation to ABS.[9] The Conference of the Parties to the CBD serving as meeting of the Parties to the Nagoya Protocol shall periodically take stock of the use of the model contractual clauses, codes of conduct, guidelines and best practices and/or standards.[10]

Development of the Elements to Facilitate Domestic Implementation of Access and Benefit-sharing for Different Subsectors of Genetic Resources for Food and Agriculture (ABS Elements)

11. The Commission, at its Fourteenth Regular Session, considered the need for and modalities of ABS for GRFA, taking into account relevant international instruments. The Commission put in place a process the output of which are these *Elements to Facilitate Domestic Implementation of Access and Benefit-sharing for Different Subsectors of Genetic Resources for Food and Agriculture (ABS Elements)*.[11]

12. The Commission established a Team of Technical and Legal Experts on Access and Benefit-sharing (ABS Expert Team) consisting of up to two representatives from each of the seven FAO regions. As requested by the Commission, the ABS Expert Team:

- Coordinated, with the assistance of the Secretariat, by electronic means as appropriate, to help prepare the intergovernmental technical working group meetings, and based on input from their regions prepared written materials and proposed guidance for the intergovernmental technical working groups;
- Participated in the relevant portions of the meetings of the intergovernmental technical working groups, to help inform and shape the intergovernmental technical working group discussions and output on ABS; and
- Worked after each intergovernmental technical working group meeting with the Secretariat to compile the intergovernmental technical working group outputs into the *ABS Elements*, and communicated the *ABS Elements* to their regions for information.

13. The elaboration of the *ABS Elements* and the work of the Commission's intergovernmental technical working groups built upon and benefited from inputs received, at the Commission's invitation, from governments and relevant stakeholders.[12]

II. OBJECTIVE OF THIS DOCUMENT

14. The overall objective of this document is to assist governments considering developing, adapting or implementing legislative, administrative or policy measures for ABS, to take into account the importance of GRFA, their special role for food security and the distinctive features of the different subsectors of GRFA, while complying, as applicable, with international ABS instruments.

III. CONSIDERATIONS FOR DEVELOPING, ADAPTING OR IMPLEMENTING ABS MEASURES FOR GENETIC RESOURCES FOR FOOD AND AGRICULTURE (GRFA)

15. In developing, adapting or implementing ABS measures addressing GRFA, governments may wish to consider taking the following steps:

[9] Nagoya Protocol, Article 19.1; 20;1.
[10] Nagoya Protocol, Article 19.2; 20.2.
[11] CGRFA-14/13/Report, paragraph 40.
[12] CGRFA/TTLE-ABS-1/14/Inf.2; CGRFA/TTLE-ABS-1/14/Inf.3.

1. Assessment of the concerned subsectors of GRFA, including their activities, socio-economic environments and use and exchange practices

a. Distinctive features of GRFA

In a first step, governments may wish to analyse the distinctive features of the subsectors of GRFA, as they present themselves in their countries. Attempts to identify the distinctive features of agricultural biodiversity have been made by the fifth meeting of the Conference of the Parties of the CBD[13] and by the Commission, at its Fourteenth Regular Session.[14] Both bodies stressed: the essential role of GRFA for food security; the dependence of many GRFA on human intervention or influence; the high degree of interdependence between countries for GRFA; the fact that many GRFA have been shaped, developed, diversified and conserved through human activities and practices over generations; the relevance of *ex situ* conservation to varying degrees depending on the subsector of the GRFA; the relevance of *in situ* conservation to the conservation of all GRFA to maintain a dynamic portfolio of agricultural biodiversity.

b. Different forms of utilization of subsectors and variations within subsectors of GRFA

Governments may also wish to take into account the different forms and existing practices in which the different subsectors of GRFA make use of GRFA.

c. Legal, policy and administrative measures, including existing practices

Some subsectors of GRFA have developed specific practices for the use and exchange of genetic resources for research and development purposes; others, such as PGRFA falling under the Treaty's Multilateral System of Access and Benefit-sharing (MLS), are covered by specific administrative or sometimes even legal measures. Analysing existing commercial and research practices as well as regulatory measures addressing the use and exchange of GRFA for research and development will assist governments in the preparation of ABS measures which make use of and are in line with existing practices and thus, avoid, to the extent possible and appropriate, the creation of additional administrative procedures. Governments may also wish to take into account the national legal framework of relevance to the implementation of ABS provisions, including property law, contract law and other laws, as applicable.

d. Possible implications of the scope, including subject-matter and temporal scope, of ABS measures

Governments may wish to analyse in some detail the implications of the scope, including the subject-matter and the temporal scope, of their ABS measures. With regard to the temporal scope of ABS measures, governments may wish to consider, in particular, the implications of applying ABS measures to materials originating from other countries that have been collected prior to the entry into force of their ABS measures.

e. Flows of germplasm, including international flows, within the different subsectors

The extent of the historical and current exchange of germplasm and the proportion of exotic diversity used vary between subsectors of GRFA. While animal and plant genetic resources have extensively been exchanged, in other subsectors this may not be the case. While some of the most relevant species have been moved extensively throughout the world, others are just starting to be farmed in aquaculture or are only used within their natural habitat in native forests for the time being, and their exchange has been limited so far. In developing, adapting or implementing ABS measures, governments may wish to consider carefully the relevance of germplasm

[13] COP 5 Decision V/5, *Appendix*, paragraph 2.
[14] CGRFA-14/13/Report, *Appendix E*, see *Appendix* to this document.

flows for the subsectors relevant to food and agriculture in their countries and possible future changes of the germplasm flows due to climate change.

f. Possible gaps of ABS measures
In reviewing existing ABS measures, governments may wish to identify any gaps with regard to GRFA or related activities and determine the need for additional regulatory measures. Similarly, governments may wish to identify GRFA or related activities that may merit exclusion or modified measures.

2. Identification and consultation of relevant governmental entities and non-governmental stakeholders holding, providing or using GRFA

In the development, adaptation or review of ABS measures, governments may wish to identify and consult relevant governmental and non-governmental stakeholders, providing or utilizing GRFA, including farmers and indigenous and local communities, genebanks and collections, research institutions as well as private sector entities. It is particularly important to consult government entities responsible for different subsectors of GRFA. The purpose of such consultations may be manifold as they may: help raising awareness among stakeholders; allow policy and decision makers to get an insight into the specificities of the different subsectors of GRFA and the existing practices of using and exchanging genetic resources; inform potential users and providers of traditional knowledge associated with genetic resources and of genetic resources that are held by indigenous and local communities about their rights and obligations; help facilitating the implementation of future ABS measures.

3. Integration of ABS measures with broader food security and sustainable agricultural development policies and strategies

ABS measures for GRFA may be considered in the wider context of sustainable agricultural development and food security. Not always will those being responsible for ABS also be in charge of sustainable agricultural development and food security strategies. It is important to coordinate different policy areas and goals and integrate them into a broader and consistent agriculture strategy.

4. Consideration and evaluation of options for ABS measures

Based on an assessment of the concerned subsectors of GRFA, including their activities, socio-economic environments and use and exchange practices, and following appropriate consultations with relevant stakeholders and consideration of different options for ABS measures, governments may wish to develop, adopt or implement their ABS measures.

5. Integration of implementation of ABS measures in institutional landscape

ABS measures cut across different sectors of GR and GRFA for which often different ministries and competent authorities hold the responsibility. Governments may wish to consider using the existing infrastructures of the sectors and subsectors for the implementation of ABS measures, rather than creating new and additional administrative layers. Using and adapting, as appropriate, existing structures, administrative procedures as well as sectoral practices may facilitate the smooth operationalization and implementation of ABS measures. It is important to minimize the transaction costs for providers and user of implementing and complying with any ABS measures.

6. Communication of and awareness-raising regarding ABS measures to potential providers and users of GRFA

Communicating and raising awareness of ABS measures to potential providers, holders and users of GRFA is essential. Various communication and awareness-raising tools may be considered. Effective communication and awareness-raising strategies usually combine different communication tools and aim to provide stakeholder-specific information whenever necessary.

7. *Ex ante* assessment as well as monitoring of the effectiveness and impact of ABS measures for GRFA

Possible implications, side effects and implementation difficulties may often be anticipated through scenario-based testing of policy measures. Given the many challenges and innovations ABS measures may pose, governments may wish to carry out such tests and/or monitor the effects by agreeing on a set of relevant indicators and mechanisms for stakeholder feedback.

IV. ABS FOR GRFA: THE INTERNATIONAL LEGAL FRAMEWORK

16. In establishing their national framework on ABS for GRFA, governments need to be aware of their legal obligations. Essentially three international instruments make up the global framework of ABS for genetic resources: the CBD, the Nagoya Protocol and the Treaty. It is noted that the three instruments are legally binding only for their Contracting Parties.[15]

Convention on Biological Diversity

17. The CBD requires its Contracting Parties to take legislative, administrative or policy measures, as appropriate, with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Parties providing such resources.[16] Access to genetic resources shall be subject to prior informed consent (PIC) of the Contracting Party providing such resources that is country of origin of such resources or has acquired them in accordance with the CBD, unless otherwise determined by that Party.[17] Access, where granted, shall be on MAT.[18] Potential benefits to be shared also include: access to and transfer of technology using genetic resources; participation in biotechnological research activities based on the genetic resources; and priority access to the results and benefits arising from biotechnological use of the genetic resources.[19]

Nagoya Protocol

18. The Nagoya Protocol is a supplementary agreement to the CBD and provides a legal framework for the effective implementation of the third objective of the CBD on benefit-sharing in support of its other two objectives, namely the conservation and sustainable use of biodiversity. The Nagoya Protocol applies to genetic resources and to traditional knowledge associated with them. It aims to achieve the fair and equitable sharing of benefits, by setting out provisions governing access (for Parties requiring PIC), appropriate technology transfer and funding; and it sets out compliance provisions. (More detailed information on the Nagoya Protocol will be provided throughout this document.)

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[15] For lists of Parties, see, for the CBD: http://www.cbd.int/information/parties.shtml; for the Nagoya Protocol: http://www.cbd.int/abs/nagoya-protocol/signatories/default.shtml; for the Treaty: http://planttreaty.org/list_of_countries.

[16] CBD, Article 15.7.

[17] CBD, Article 15.5; 15.3.

[18] CBD, Article 15.4.

[19] CBD, Articles 15.7; 16; 19; 20; 21.

International Treaty on Plant Genetic Resources for Food and Agriculture

19. Like the CBD and the Nagoya Protocol, the Treaty is based on the premise that States have sovereign rights over their genetic resources and that the authority to determine access to these resources lies with national governments. Under the Treaty, the Contracting Parties exercised their sovereign rights to establish the MLS, to facilitate access and the sharing of monetary and non-monetary benefits arising from the use of PGRFA through standardized conditions as set out in the Standard Material Transfer Agreement (SMTA). While the Treaty applies to all PGRFA, its MLS applies only to PGRFA set out in Annex I to the Treaty that are under the management and control of the Contracting Parties and in the public domain.

Relationship between the Nagoya Protocol and specialized international ABS instruments

20. The Nagoya Protocol states that where a specialized international ABS instrument applies that is consistent with, and does not run counter to the objectives of the CBD and the Nagoya Protocol, the Nagoya Protocol does not apply for the Party or Parties to the specialized instrument in respect of the specific genetic resource covered by and for the purpose of the specialized instrument.[20] The Treaty is such a specialized international ABS instrument which is consistent with and does not run counter to the objectives of the CBD and the Nagoya Protocol.

21. It should be noted that the Nagoya Protocol shall be implemented in a mutually supportive manner with other international instruments relevant to the Nagoya Protocol. Due regard shall also be paid to useful and relevant on-going work or practices under such international instruments and relevant international organizations, provided they are supportive of and do not run counter to the objectives of the CBD and the Nagoya Protocol.[21]

V. RATIONALE OF ABS MEASURES FOR GRFA

22. Considering that GRFA are an integral part of agricultural and food production systems and therefore play an essential role for achieving food security and sustainable agricultural development, and that the international exchange of GRFA is essential to the functioning of the sector, ABS measures may be instrumental in furthering the achievement of food security and improving nutrition. There is general consensus that food and nutrition security requires effective conservation of GRFA and that the effective conservation of GRFA requires their continued use by farmers (including smallholders), indigenous and local communities, research institutions, breeders and other stakeholders. Therefore, ABS measures aiming at achieving food security and the conservation of GRFA should aim at facilitating and actively encouraging the continued use and exchange of GRFA and benefit-sharing.

23. There is also agreement that the conservation and sustainable use of GRFA are essential to the sustainable development of agricultural production. Productivity, adaptability and resilience of agro-ecosystems depend on the diversity of GRFA.

VI. ELEMENTS OF ABS MEASURES FOR GRFA

24. Under the Nagoya Protocol, Parties shall consider, in the development, adaptation and implementation of their ABS measures, the importance of GRFA and their special role for food security.[22] The *ABS Elements* for national ABS measures for GRFA highlight those areas of ABS policy which may deserve particular attention from the perspective of research and development in food and agriculture.

25. National ABS measures for GRFA should be simple and flexible. *Simplicity* is a challenge given the complexity of the matter and given the variety of situations in which GRFA may be

[20] Nagoya Protocol, Article 4.4.
[21] Nagoya Protocol, Article 4.3.
[22] Nagoya Protocol, Article 8(c).

accessed, transferred to others, further improved and used for research and development. *Flexibility* is therefore necessary to allow administrators to adjust the implementation of ABS measures to new and newly identified situations and challenges. ABS measures should leave sufficient flexibility to accommodate new and newly identified situations without having to revise the legislation as such. ABS measures should therefore allow for an evolutionary implementation approach which allows to improve the operation of the ABS system through practice, self-perfection and innovation. Parties to the Nagoya Protocol need to establish clear and transparent measures to implement it. Developing and implementing ABS measures is *work in progress* and so is the development of these *ABS Elements*.

26. National measures on ABS for GRFA may be associated with considerable transaction costs for administrators and stakeholders and governments may wish to assess and minimize them in developing, adapting or implementing these measures.

27. In designing legislative, administrative or policy measures for ABS that reflect the special needs of GRFA, governments may wish to address a wide range of issues, addressed further below, to facilitate the domestic implementation of ABS for the different subsectors of GRFA:

(1) Institutional arrangements;
(2) Access to and utilization of GRFA;
(3) Access to traditional knowledge associated with GRFA;
(4) Fair and equitable sharing of benefits;
(5) Compliance and monitoring**.**

1. Institutional Arrangements

28. ABS measures will often specify the institutional arrangements for the management of ABS. Depending on the structure of a state, the form of government, the international ABS instruments to which the state is a Party and, where relevant, the jurisdictional division of responsibility and depending on the ABS measures chosen, one or several competent authorities may be tasked with the administration of ABS measures. These can be either existing or new authorities. Several authorities within one country may also share the responsibility according to the geographical origin of the resource, the purpose for which it is to be accessed and utilized, the involvement of traditional knowledge associated with the genetic resource, the rights indigenous and local communities may have over the resource or any other criteria that seem appropriate and practical.

- Each Party to the Nagoya Protocol has to designate a single national focal point responsible for liaison with the CBD Secretariat and providing relevant information to applicants.[23]
- Parties to the Nagoya Protocol also have to designate one or more competent national authorities responsible for granting access and advising on applicable procedures and requirements for obtaining PIC and entering into MAT.[24]
- The same entity may fulfil the functions of both focal point and competent national authority.[25]
- Where more than one competent national authority for the Nagoya Protocol is designated (e.g. for different subsectors of GRFA) the national focal point must provide information about their respective competencies and mandates.
- Under the Treaty, facilitated access is provided pursuant to the SMTA adopted by the Treaty's Governing Body.[26] In practice, most Parties to the Treaty have national focal points, and institution(s) actually providing access to MLS material do so only upon acceptance of the SMTA by the recipient of the material.

29. To clarify institutional arrangements around ABS for GRFA, governments may wish to:

- Take stock of existing institutions and institutional arrangements that are potentially relevant;

[23]Nagoya Protocol, Article 13.1.
[24] Nagoya Protocol, Article 13.2.
[25] Nagoya Protocol, Article 13.3.
[26] Treaty, Article 12.4.

- Decide on the allocation of institutional responsibility for various aspects of ABS as they apply to different subsectors of GRFA;
- Put in place mechanisms and/or procedures for communication and coordination between designated institutions; and
- Publicise and provide information about the resulting institutional arrangements.

30. Whatever institutional arrangements are chosen, it is of pivotal importance that the institutional arrangements are clear and transparent, and that adequate coordinating and information exchange mechanisms are in place. Users of genetic resources need to know when PIC is required, whom they have to ask for PIC and with whom they may negotiate MAT, if this is what the ABS measures require. Where several, *e.g.* federal and state, authorities are involved in one and the same decision, the authorization procedure may quickly become complicated, time-consuming and transaction costs may increase considerably. To avoid overly burdensome institutional arrangements it would be useful to identify existing arrangements that may be used to address PIC and MAT. Where several authorities are involved in the approval procedures, governments may wish to consider designating one lead authority or national clearinghouse to oversee the whole chain of partial approvals, communicate with the applicant and ultimately grant one cumulative authorization, once all relevant authorities have given their green light.

2. Access to and utilization of GRFA

31. In developing, adapting or implementing ABS measures dealing with access to GRFA it is necessary to specify:

(i) the categories of genetic resources covered by the access provisions;
(ii) intended uses triggering the application of access provisions;
(iii) the authorization procedures applicable, depending on the category of genetic resource and the purpose for which the resource is to be used.

(i) Categories of genetic resources covered by access provisions

32. In the CBD and the Nagoya Protocol the term "genetic resources" means "genetic material of actual or potential value" and genetic material means "any material of plant, animal, microbial or other origin containing functional units of heredity."[27] This definition is also mirrored in the Treaty, which defines "plant genetic resources for food and agriculture" as "any genetic material of plant origin of actual or potential value for food and agriculture".[28] Parties to the Treaty should make sure that their ABS framework addresses their obligations under the Treaty.

Temporal scope of access measures for GRFA

33. There is an international debate about the temporal scope national ABS measures could or should have. The Nagoya Protocol, in the absence of any rules to the contrary, does not prevent its Parties from applying their national ABS measures to utilizations or access to genetic resources that fall outside the scope of the Nagoya Protocol. However, with regard to resources outside the scope of the Nagoya Protocol, Parties cannot necessarily rely on the support of user country compliance measures, as set out in Articles 15 – 18 of the Nagoya Protocol, or compliance measures in non-Parties.

Genetic resources provided by countries of origin/countries which acquired them in accordance with the CBD

34. Parties to the CBD will usually apply their access measures to genetic resources for which they are the country of origin or which they have acquired in accordance with the CBD. "Country of origin of genetic resources" means the country which possesses those genetic resources in *in situ*

[27] CBD, Article 2.
[28] Treaty, Article 2.

conditions.[29] "*In situ* conditions" means conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.[30]

35. In the case of many GRFA, it may be difficult to determine with certainty the country of origin. GRFA have been widely exchanged across regions, countries and communities over often long periods of time. Many different stakeholders, including indigenous and local communities, farmers, researchers and breeders have contributed to the development of GRFA, in different places and at different points in time. In fact, the maintenance and evolution of many GRFA depend on continued human intervention, and their sustainable utilization in research, development and production is an important instrument to ensure their conservation.

36. ABS measures need to be clear as to which GRFA are covered by the relevant access provisions.

Privately versus publicly held genetic resources

37. While the Treaty's MLS addresses only PGRFA "that are under the management and control of the Contracting Parties"[31] as well as materials brought within the purview of the Treaty by other holders,[32] the Nagoya Protocol does not make the distinction between genetic resources which are under the management and control of government and other categories of genetic resources.

38. Given that a significant amount of GRFA is privately held, in particular in sectors like the livestock sector, ABS measures need to be clear as to whether they apply to privately or only to publicly held GRFA. ABS measures may have a significant impact on the exchange of such GRFA. Such laws may also need to clarify the hierarchy or relationship of different proprietary, including intellectual property, and quasi-proprietary and other rights related to genetic resources.

Genetic resources versus biological resources

39. The Nagoya Protocol covers "genetic resources" and their utilization.[33] However, some ABS measures also cover "biological resources" and their utilization. Governments should reflect whether the inclusion of biological resources in ABS measures and their use beyond utilization, as addressed in the Nagoya Protocol, has any effect on the use of and access to GRFA.

Genetic resources held by indigenous and local communities

40. The Nagoya Protocol also addresses, as a special case, genetic resources held by indigenous and local communities. The Protocol requires Parties in such case to take measures, in accordance with domestic law, as appropriate, with the aim of ensuring that the PIC or approval and involvement of indigenous and local communities is obtained for access to genetic resources where they have the established right to grant access to such resources[34].

41. ABS measures implementing the Nagoya Protocol may foresee procedures for the PIC or approval and involvement of the indigenous and local communities where they have the established right to grant access to such resources. The community PIC, as such, is a challenging, even though not completely new concept. National measures should address how PIC or approval and involvement of the indigenous and local communities may be obtained, taking into consideration indigenous and local communities' customary laws, community protocols and procedures, as applicable.

(ii) Intended uses triggering the application of access provisions

[29] CBD, Article 2.
[30] CBD, Article 2.
[31] Treaty, Article 11.2.
[32] Treaty, Articles 15; 11.3.
[33] CBD, Article 2.
[34] Nagoya Protocol, Article 6.2.

Research and development on the genetic and/or biochemical composition of GRFA

42. Some national ABS measures apply to specific uses of genetic resources, i.e. to their use in research and development. The Nagoya Protocol provides that "access to genetic resources for their utilization shall be subject to PIC by the country providing such resources that is the country of origin of such resources or that has acquired the genetic resources in accordance with the Convention (…)" unless otherwise determined by that Party[35]. "Utilization of genetic resources" means "to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology (…)."[36]

43. Other ABS measures cover further uses that trigger the application of access provisions. Under those measures, the acquisition of genetic resources for certain purposes other than research and breeding may require PIC, for example the use of genetic resources for the extraction of specific compounds. The measures often refer to "biological resources", meaning that the resources are not used for their genetic composition, but as an end product or commodity. The rationale for such broad definition is the experience that compounds used in the pharmaceutical and cosmetic industry are often extracted from agricultural products sourced through intermediaries from local markets at local prices which at times do not reflect the actual market value of the extracted compounds.

44. A broad definition of purposes that would capture a whole range of activities that typically and regularly happen with agricultural commodities in the course of food production, will obviously imply that access provisions would apply to a possibly large number of transactions where for the time being the assumption of buyers of such commodities in most countries might be that in such cases the sales contract manifests the ABS agreement. In fact, the sales contract may or may not satisfy ABS requirements according to national measures.

45. For non-Parties to the Nagoya Protocol there is also the option of a different approach.

Development of genetic resources in the course of agricultural production

46. If the activities triggering access provisions are limited to "utilization" within the meaning of the Nagoya Protocol, certain typical uses of GRFA, for example the growing of seeds for subsequently using the harvested products for human consumption clearly do not qualify as utilization and therefore do not trigger the application of access provisions.

47. Other activities regularly performed with respect to GRFA are more difficult to classify. The question may arise whether selection and reproduction of plant genetic resources by a farmer or farming community based on phenotypical traits and not entailing any genetic methods, qualify as "utilization". Similarly, fish farming while serving the purpose of producing fish for human consumption may simultaneously, through natural selection due to the hatchery environment, contribute to the genetic development and, in fact, domestication of the fish. Provenance trials which help to identify tree seedlings best adapted to the conditions of a specific planting site may simply serve the purpose of reforestation and the production of timber on sites that are similar to the test environment; on the other hand provenance research is also important for the planned breeding within and between species. The use of cattle embryos or bovine semen for reproduction and, ultimately, diary or meat production may be considered as falling outside the boundaries of "utilization". However, the selection of semen-donor bulls and the selection of offspring for multiplication may entail aspects of research and development. Subject to national measures, the assumption of stakeholders when selling genetic material in the form of semen, embryos, etc., will often be that its value as a genetic resource is already reflected in its price, and that the buyer will be free to use it for further research and breeding.[37] If, however, the planned use of such material qualifies as "utilization," as defined by national measures, access requirements may apply.

[35] Nagoya Protocol, Article 6.1.
[36] Nagoya Protocol, Article 2(c).
[37] Background Study Paper No. 43. 2009. The use and exchange of animal genetic resources for food and agriculture, p. 28.

48. Many GRFA are being shaped, developed and improved through their continued use in agricultural production. Where "research and development" and agricultural production occur in tandem, it may be difficult to distinguish "utilization" from activities related to the production of agricultural products for sale and human consumption. ABS measures could provide guidance as to the treatment of these cases, for example by listing examples of activities/purposes of use that fall under "utilization" and other examples which fall outside the definition of "utilization". Further technical guidance will be important to facilitate the implementation of national ABS measures.

Research and development for food and agriculture

49. In the light of Article 8(c) of the Nagoya Protocol, governments could consider to treat the access to and utilization of genetic resources differently if it is intended to contribute to food and agricultural research and development. One option would be for a country not to require PIC for such resources. Alternatively, special procedural requirements, or benefit-sharing standards could apply or a special authority could, for example, be responsible for ABS. ABS measures making this distinction, could consider whether they should or should not include non-food/feed agricultural products.[38] However, a distinction between food/feed and non-food/feed agricultural products faces the difficulty that at the stage of research and development it will often be unknown for which purpose the outcome will end up being used. Many agricultural products may be and are used for both food and non-food purposes. Still ABS measures could, for example, exempt from "research and development for food and agriculture" research and development that is intended to exclusively serve non-food/feed purposes.

Commercial/non-commercial research and development

50. ABS measures sometimes distinguish between commercial and non-commercial utilization of genetic resources. Non-commercial utilization often benefits from softer authorization requirements and simpler authorization procedures. PIC is often required for both forms of utilization. However, in the case of non-commercial utilization, recipients are sometimes given the option not to negotiate the sharing of monetary benefits immediately, if they agree to get back to the provider and negotiate monetary benefit-sharing, should their intent change. Countries should consider how to identify triggers that signal when change of intent occurs and how to address such changes of intent.

51. The distinction between commercial and non-commercial utilization, which is particularly important for taxonomic research and encouraged by the Nagoya Protocol,[39] might have limited application in the case of certain aspects of agricultural research and development which aim at improving agricultural and food production and therefore might qualify, in most cases, as commercial utilization. However, the distinction may be significant for taxonomic research used to build frameworks for distinguishing pests and pathogens and alien taxa from indigenous, or beneficial or harmless taxa.

Exemption of specific activities

52. ABS measures may also exempt certain utilizations of genetic resources from any ABS requirements. For example, the exchange of genetic resources within and among local and indigenous communities and small-scale farmers as well as exchange practices within nationally recognized research networks could be exempted from any access requirements and, possibly, the ABS measures as such.

(iii) Authorization procedures

53. The Nagoya Protocol provides that access to genetic resources for their utilization shall be subject to the PIC of the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the CBD, unless otherwise determined by that Party.[40]

[38] See Treaty, Article 12.3(a).
[39] Nagoya Protocol, Article 8(a).
[40] Nagoya Protocol, Article 6.1.

PIC

54. Many variations of authorization procedures exist and governments may therefore wish to consider advantages and disadvantages of the different options and adapt procedures to the different categories of genetic resources and the different purposes for which they are intended to be used. The Nagoya Protocol does not provide in any detail how PIC should be granted and thus leaves its Parties, within the boundaries of Article 6.3 of the Nagoya Protocol, considerable flexibility as to how the authorization procedure may be designed. Parties to the Nagoya Protocol may also provide for different types of authorization procedures depending on the user. In any event, it is important that the procedures be streamlined and clear for providers and users alike. The selection of different types of authorization procedures given below does not claim to be exhaustive.

Standard and fast-track PIC

55. Governments may wish to establish standard procedures and, in addition, fast-track procedures for certain situations, e.g. for access to certain materials; for materials which are to be used for certain purposes, e.g. research and development for food and agriculture; for access by certain stakeholders, e.g. farmers; or for combinations of these scenarios.

Implicit PIC

56. ABS measures may also provide for implicit informed consent procedures for specific materials, purposes, stakeholders or other situations. In this case, access to and utilization of genetic resources could proceed without an explicit PIC by the competent authority. Implicit PIC does not rule out the possibility of benefit-sharing. Relevant ABS measures could provide, for example, that in the case of implicit PIC, the recipient has to agree with the competent authority on the terms and conditions of benefit-sharing prior to the commercialization of a product derived from the genetic resource.

Standardization of PIC (and MAT)

57. A typical regulatory response to the high number of transfers of GRFA and the recurrent exchange events in the food and agriculture sector could be the standardization of access procedures, terms and conditions. The Treaty already establishes a fully functioning precedent for this approach through its SMTA.

58. A good starting point for the use of standardized procedures and conditions could be already existing pools of GRFA, for instance in the form of collections and genebanks, provider and user communities and networks. Their established exchange practices may offer useful models to build upon, as they often include the use of an agreed set of conditions and modalities, sometimes even formalized in the form of codes of conduct, guidelines or material transfer agreements.

59. ABS measures may establish standard ABS conditions for specific materials, purposes, stakeholders or other standard situations. Recipients accessing and using specified genetic resources, for example, for specified research/development purposes, would have to abide by a set of access and benefit-sharing conditions pre-defined in the ABS measures. Given the variety of resources, the variety of purposes for which they may be used and the variety of stakeholders, standardization of ABS may not work as an overall solution for all GRFA. However, for specific types of utilization of genetic resources which usually generate a similar scale of benefits, standardization of ABS may be a viable option and, in addition, a powerful instrument to attract recipients who prefer abiding by a set of pre-defined ABS standards over having to negotiate bilateral ABS agreements on a case-by-case basis.

60. The standardization of PIC (and MAT) procedures may, if the agreed standards are adequate and have been developed in line with existing practices and upon consultation of relevant stakeholders, help to reduce transaction costs considerably, and may also help to speed up the administrative decision-making processes.

Framework PIC (and MAT)

61. As the international exchange of genetic material is a longstanding practice in the food and agriculture sector, many stakeholders rely on it and business practices have been structured accordingly, often characterized by transnational specialization and division of labour. The different stakeholders managing and using GRFA are interdependent and GRFA are often exchanged in the framework of close working collaborations and partnerships, with many stakeholders acting rather as intermediaries in the value chain, i.e. being neither the original provider nor the end user of a specific GRFA.

62. ABS measures may accommodate these practices by providing for the possibility to conclude framework agreements which authorize access to and utilization of a specified range of genetic resources, possibly limited to specific purposes, provided benefits are shared as and when agreed. In this case users would not have to request access for each genetic resource separately and may still notify every accession they actually accessed and used for research and breeding to provide legal certainty to users and facilitate monitoring of compliance with the framework agreement. The framework PIC may be particularly appropriate for sectors which exchange large numbers of germplasm among the different stakeholders along the value chain during research and development.

3. Access to traditional knowledge associated with GRFA

63. Under the Nagoya Protocol, in accordance with domestic law, each Party shall take measures, as appropriate, with the aim of ensuring that traditional knowledge associated with genetic resources is accessed with the PIC or approval and involvement of the indigenous and local communities holding such traditional knowledge, and that MAT have been established.[41] It is important to note that these requirements apply for traditional knowledge associated with genetic resources irrespective of whether genetic resources are being made available at the same time.

64. The Protocol requires that, in accordance with domestic law, Parties take into consideration indigenous and local communities' customary laws, community protocols and procedures with respect to traditional knowledge associated with genetic resources. National focal points shall provide, where possible, information on procedures for obtaining PIC or approval involvement, as appropriate, of indigenous and local communities. Further guidance may well be required as to how PIC or approval and involvement by indigenous and local communities may be obtained. In the case of traditional knowledge associated with GRFA, much of this knowledge may be shared by several communities and national measures need to clarify how in such cases a fully valid approval may be obtained.

65. It should be noted that Article 9 on Farmers' Rights in the Treaty includes a provision on the protection of traditional knowledge relevant to PGRFA.

4. Fair and equitable sharing of benefits

(*i*) *Scope of benefit-sharing obligations*

66. Many GRFA may have been collected long before the application of national ABS measures. For these resources the question is no longer whether or under which conditions they may be accessed as access has already occurred. ABS measures should be clear as to whether they require the sharing of benefits arising from new or continued uses of genetic resources or associated traditional knowledge accessed prior to the ABS measures having been put into place. As noted above, there is an international debate on the temporal scope of the Nagoya Protocol.

67. Governments may wish to consider carefully the implications of expanding the scope of their ABS measures to previously accessed GRFA or traditional knowledge. As most countries are using GRFA originating from other countries, ABS measures covering previously accessed GRFA could lead to considerable uncertainty regarding the status of such resources and, more importantly, severely discourage potential users from utilizing such GRFA for research and development.

[41] Nagoya Protocol, Article 7.

(ii) Fair and equitable

68. The fair and equitable sharing of benefits arising from the utilization of genetic resources is a key component of ABS measures. Benefits may include monetary and non-monetary benefits. According to the Nagoya Protocol, benefits arising from the utilization of genetic resources as well as subsequent applications and commercialization shall be shared in a fair and equitable way with the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the CBD.[42] Such sharing shall be on MAT. Bilateral case-by-case negotiations of MAT for GRFA may entail high transactions costs and therefore not be practical. Providers and users of GRFA may therefore wish to rely on model contractual clauses, codes of conducts, guidelines, best practices and/or standards developed for their sector or subsector. Benefits shared under the MLS of the Treaty include: the exchange of information, access to and transfer of technology, capacity-building and the sharing of benefits arising from the commercialization of PGRFA.[43] Some of these benefits are specified in the SMTA of the Treaty.

(iii) Beneficiaries

69. Identifying the proper beneficiary or beneficiaries may be particularly difficult in the case of GRFA. The innovation process for many GRFA, in particular plant and animal genetic resources, is usually of incremental nature and based on contributions made by many different people in different places at different points of time. Most products are not developed out of an individual genetic resource, but with the contributions of several genetic resources at different stages in the innovation process.

70. Sharing the benefits in a fair and equitable way and sharing the benefits with the proper beneficiary may therefore become a major challenge for most subsectors of GRFA, including aquatic and forest genetic resources where breeding technologies play an increasingly important role. Depending on the extent to which genetic resources and associated traditional knowledge contribute to a final product, it may become difficult to determine the fair and equitable sharing of benefits with the different countries and indigenous and local communities that contributed genetic resources and/or traditional knowledge. Where it is difficult to determine the country of origin of GRFA, the question may arise whether several countries may be considered the country of origin of a genetic resource where the genetic resource has acquired its distinctive properties in the natural surroundings of these countries.

71. Various options may be considered to accommodate the incremental nature of the innovation process typical to many GRFA. There may be circumstances in which providers and users are best positioned to negotiate benefit-sharing among themselves. Alternatively, benefits could, for example, be decoupled from individual providers or accessions, pooled in a national benefit-sharing fund or other cooperative arrangements and be distributed in line with agreed policies and disbursement criteria. This option could be considered, in particular, for the distribution of benefits among different beneficiaries at national level (e.g. the state and various indigenous and local communities). However, where the genetic resources originate from different countries, governments may wish to consider how to reflect the interests and views of the countries involved in the benefit-sharing models, including through the use of multilateral solutions.

(iv) Monetary and non-monetary benefits

72. The terms and conditions of monetary and non-monetary benefit-sharing will often depend on the particularities and specificities of the subsector, the species, the concrete intended use etc. However, access to GRFA will always be a benefit in itself, as is stated for PGRFA in Article 13(1) of the Treaty, and governments may wish to consider how to address forms of utilization that restrict subsequent access. The mutual exchange of GRFA may be an option which governments may wish to consider as it would allow for access to GRFA without having to negotiate the sharing of monetary benefits and yet offers substantial benefits to both sides.

[42] Nagoya Protocol, Article 5.1.
[43] Treaty, Article 13.2.

73. Considering the important non-monetary benefits of GRFA, such as characterization data, research results, capacity-building and technology transfer, ABS measures for GRFA may identify non-monetary benefits which are of particular relevance to the food and agriculture sector. The Nagoya Protocol lists research directed towards food security, taking into account domestic uses of genetic resources in the country providing genetic resources, as well as food and livelihood security benefits as possible non-monetary benefits.[44]

(v) Sharing benefits through partnerships

74. As the international exchange of genetic material is a longstanding practice in the food and agriculture sector, many stakeholders rely on it and business practices as well as scientific collaboration partnerships have been structured accordingly. The different stakeholders managing and using GRFA are interdependent and GRFA are often exchanged in the framework of close working collaborations and partnerships, with many stakeholders acting in the value chain being neither the original providers nor the end users of the GRFA. To manage the sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, ABS measures may allow for benefit-sharing arrangements to be part of broader research partnership agreements. Such framework agreements (see above, paragraphs 61-62) may cover a range of genetic resources. Conversely, governments may wish to consider regulating exchanges of GRFA that could adversely impact the diversity of local GRFA.

(vi) Global multilateral benefit-sharing mechanism

75. Parties to the Nagoya Protocol have agreed on a process to consider the need for and modalities of a global multilateral benefit-sharing mechanism which may be relevant to benefit-sharing for GRFA.[45]

5. Compliance and monitoring

76. There are different types of compliance measures in the area of ABS, including: compliance of countries with an international instrument, such as the Treaty or the Nagoya Protocol; compliance of users with PIC and MAT; and compliance with domestic legislation of the providing country. With regard to the third type of compliance, the Nagoya Protocol requires each Party to take appropriate, effective and proportionate legislative, administrative or policy measures to provide that genetic resources utilized within its jurisdiction have been accessed in accordance with PIC and that MAT have been established, as required by the domestic ABS legislation or regulatory requirements of the other Party. Parties to the Nagoya Protocol shall also take measures to address non-compliance with user country measures and cooperate in cases of alleged violations.[46] To support compliance, Parties to the Nagoya Protocol shall also take measures, as appropriate, to monitor and to enhance transparency about the utilization of genetic resources, which shall include the designation of one or more checkpoints.[47] It should be noted that under the Treaty, access shall be accorded expeditiously without the need to track individual accessions.[48]

77. Compliance measures may pose challenges to the food and agriculture sector if the ABS status of GRFA used in breeding is unknown to users. Governments may wish to consider distinctive solutions for this problem, including through supporting the development of subsectoral standards building on current best practices, such as the breeders' exemption, or putting in place multilateral solutions.

[44] Nagoya Protocol, Annex, sections 2(m); 2(o).
[45] Nagoya Protocol, Article 10; Decision NP I/10.
[46] Nagoya Protocol, Article 15 & 16.
[47] Nagoya Protocol, Article 17.
[48] Treaty, Article 12.3(b).

ANNEX

DISTINCTIVE FEATURES OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE[49]

The distinctive features of GRFA requiring distinctive solutions for ABS are presented below in seven clusters. They aim to reflect an equilibrium between all subsectors of food and agriculture. Not every feature is necessarily applicable to each and every GRFA and the various subsectors often have different features. Further detailing of subsector-specific features may still be developed.

The features are distinctive, but not necessarily unique to GRFA. While other genetic resources may share with GRFA some of the features listed below, the specific combination of these features distinguishes GRFA from most other genetic resources.

		WG AnGR[50]	WG FGR[51]	WG PGR[52]
A. The role of GRFA for food security	A.1 GRFA are an integral part of agricultural and food production systems and play an essential role for achieving food security and the sustainable development of the food and agriculture sector.		+	+
	A.2 Plant, animal, invertebrate and micro-organism GRFA form an interdependent network of genetic diversity in agricultural ecosystems.		+	
B. The role of human management	B.1 The existence of most GRFA is closely linked to human activity and many GRFA can be regarded as human-modified forms of genetic resources.		-	
	B.2 The maintenance and evolution of many GRFA depend on continued human intervention, and their sustainable utilization in research, development and production is an important instrument to ensure conservation.	+	-	
C. International exchange and inter-dependence	C.1 Historically, GRFA have been widely exchanged across communities, countries and regions over often long periods of time, and a relevant part of the genetic diversity used in food and agriculture today is of exotic origin.	+	-	+
	C.2 Countries are interdependent with regard to GRFA and act both as providers of some GRFA and as recipients of others.		+	
	C.3 The international exchange of GRFA is essential to the functioning of the sector, and its importance is likely to increase in future.	+	+	+

[49] This table is taken from CGRFA-14/13/Report, *Appendix E.*
[50] CGRFA-14/13/12, paragraph 32.
[51] CGRFA-14/13/10, paragraph 21.
[52] CGRFA-14/13/20, *Table 2*.

D. The nature of the innovation process	D.1 The innovation process for GRFA is usually of incremental nature and the result of contributions made by many different people, including indigenous and local communities, farmers, researchers and breeders, in different places and at different points in time.	+	+	+
	D.2 Many GRFA products are not developed out of an individual genetic resource, but with the contributions of several GRFA at different stages in the innovation process.		-	+
	D.3 Most products developed with the use of GRFA can in turn be used as genetic resources for further research and development, which makes it difficult to draw a clear line between providers and recipients of GRFA.		+	+
	D.4 Many agricultural products reach the market place in a form in which they may be used both as biological resources and as genetic resources.	-	+	
E. Holders and users of GRFA	E.1 GRFA are held and used by a broad range of very diverse stakeholders. There are distinct communities of providers and users with respect to the different subsectors of GRFA.	+	-	+
	E.2 The different stakeholders managing and using GRFA are interdependent.		+	
	E.3 A significant amount of GRFA is privately held.	+	-	
	E.4 An important part of GRFA is held and can be accessed *ex situ*.	-	-	
	E.5 An important part of GRFA is conserved *in situ* and on farm under different financial, technical and legal conditions.	+	+	
F. GRFA exchange practices	F.1 The exchange of GRFA takes place in the context of customary practices and existing communities of providers and users.	+	+	+
	F.2 An extensive transfer of genetic material between different stakeholders along the value chain occurs in research and development.	+	-	
G. Benefits generated with the use of GRFA	G.1 While the overall benefits of GRFA are very high, it is difficult to estimate at the time of the transaction the expected benefits of an individual sample of GRFA.		+	+
	G.2 The use of GRFA may also generate important non-monetary benefits.		+	
	G.3 The use of GRFA may lead to external effects going far beyond the individual provider and recipient.		+	

Note: The Intergovernmental Technical Working Groups on Plant, Animal, and Forest Genetic Resources, in reviewing the distinctive features identified by the *Ad Hoc* Technical Working Group on Access and Benefit-sharing for Genetic Resources for Food and Agriculture, highlighted features particularly relevant (marked in the table above by plus signs [+]) or less (or not) relevant (marked in the table by minus signs [-]) to their subsectors.

APPENDIX C

VOLUNTARY GUIDELINES FOR MAINSTREAMING BIODIVERSITY INTO POLICIES, PROGRAMMES AND NATIONAL AND REGIONAL PLANS OF ACTION ON NUTRITION

Objective

The objective of the Guidelines is to support countries to integrate biodiversity into all relevant policies, programmes and national and regional plans of action in view of addressing malnutrition in all its forms, and to specifically promote the knowledge, conservation, development and use of varieties, cultivars and breeds of plants and animals used as food, as well as wild, neglected and underutilised species contributing to health and nutrition.

Principles

The Guidelines support the development of nutrition-sensitive agriculture that considers the nutrient composition of biodiversity for food and agriculture (in particular the varieties, cultivars and breeds of plants and animals used as food, as well as wild, neglected and underutilised species) to address malnutrition in all its forms.

The Guidelines support the development of multi-sectoral strategies to improve nutrition and food security through the involvement of actors and stakeholders at all levels, e.g. decision-makers, policy makers and practitioners. The appropriate institutional set- up will need to be put in place at the national level to successfully implement the Guidelines. Main actors should include ministries and institutions dealing with nutrition, health, agriculture (forestry, fisheries, livestock, horticulture, and aquaculture), education, environment, trade, planning, poverty reduction, food security, rural development, economy and finance; UN organizations and other relevant international agencies; Civil Society Organizations and the private sector. Both the genetic resources for food and agriculture and the nutrition communities should be involved and actively guiding the process.

Key to the implementation of these Guidelines is the need to work with the different institutions and individuals, at different levels, involved in the planning and implementation of relevant policies and programmes. This effort should involve not just the health sector and nutrition programmes but also the agriculture sector as well as the environment, food security, education, trade, economy, and social protection sectors and their relevant stakeholders. Policies and programmes need to be mutually reinforcing across government sectors and departments and should take into account the potential contribution of biodiversity for food and agriculture. In order to be effective, strong political will and leadership are key as well as better co-operation between relevant sectors, building capacity and alliances, mobilising resources and enhancing motivation and convincing institutions and decision-makers of the crucial role biodiversity can play for nutrition outcomes if implemented in their respective policies and programmes.

The following key principles have been formulated for the successful implementation of the Guidelines which need to be taken into account during the planning stage:

- Identify all relevant sectors and development goals into which concerns on biodiversity for nutrition can be mainstreamed, including countries' follow up actions of ICN2
- Establishment of an effective institutional set-up, dialogue and cooperation at all levels and identifying relevant entry points;
- Identification of specific malnutrition issues and micro-nutrient deficiencies to be addressed;
- Development of a national action plan involving all relevant stakeholders including resource mobilization and the design of a monitoring and evaluation system;
- Strengthening of the scientific evidence base demonstrating the value of biodiversity to nutrition outcomes and creating awareness on the importance of building more nutrition-sensitive agriculture;

- Raising the awareness at all levels on the role of varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilised species, and their unique nutrient composition, in addressing malnutrition issues;
- Strengthening individual and institutional capacity.

The Guidelines are divided into three main elements:

A. RESEARCH, aiming at improving knowledge of the benefits of using different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species to address malnutrition; assessing the opportunities to address specific country nutrition issues through biodiversity for food and agriculture; and filling research gaps in relation to the composition of foods from the different sectors of genetic resources for food and agriculture, including through the meta-analysis of existing data;
B. IMPLEMENTATION, aiming at putting activities into action that integrate biodiversity for food and agriculture in nutritional and nutrition-related policies, programmes and action plans; and
C. AWARENESS, aiming at increasing the awareness of the general public and of the different stakeholders on the importance of foods from different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species, in addressing malnutrition.

The following are examples of how mainstreaming could be implemented depending on each country's needs and capabilities, as appropriate. It is understood that the implementation should be based on scientific evidence and consistent with relevant international obligations.

A: <u>RESEARCH</u>

i. Support research on nutrient contents of foods from different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species including from forest-derived foods and aquatic genetic resources.
    a. This will involve the development of partnerships at national and international level, the use of existing databases (e.g. FAO/INFOODS) and scientific literature, the generation of new data and their compilation into databases, and analysis of these data to determine the various impacts of biodiversity for food and agriculture on malnutrition prevention and treatment.
    b. The research should also support the identification of the main malnutrition issues, at local or country level, that could be addressed by biodiversity-relevant nutritional and nutrition-related policies and programmes as well as the species and/or foods that most likely would be of use to address those issues.
ii. Collaborate with regional and international bodies in the funding and organization of regional courses on the development of food composition databases on biodiversity that seek information on the influence of production systems, soil, seasons and feed, and integration of foods at the level below species (e.g. varieties, cultivars and breeds). Special emphasis should be given to analysing the vitamin and mineral content of foods, especially in animal products as these data are still scarce.
iii. Collaborate with relevant stakeholders to integrate biodiversity into food consumption surveys.
iv. Support breeding of plant and animal species based on existing biodiversity in order to obtain the necessary nutrient profile to address the existing malnutrition while maintaining positive agricultural characteristics.
v. Support research related to nutrition-sensitive production systems on the identification, characterization, conservation, development and use of varieties and breeds including of crops, livestock, forest-derived foods and aquatic genetic resources potentially useful in addressing existing malnutrition issues.
vi. Investigate mechanisms to improve the seed production system of plant varieties with appropriate nutrient profiles for their inclusion into large-scale production.

vii. Support local research to study the development of market systems for food from different varieties and breeds with appropriate nutrient profiles in order to identify ways of promoting these products to consumers.

viii. Devise mechanisms and regulations to support the presence of biodiversity even in a highly competitive market.

ix. Encourage and support investments for research into the nutrition and health attributes of food from different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species, including the private sector and food industries in order to generate data and information. This could also include meta-analysis and consumer research.

B: IMPLEMENTATION

i. Support nutrition-sensitive agricultural extension services and agricultural innovation systems to establish genetic resources systems and banks for varieties with potentially useful nutrient profiles, in collaboration with national researchers, farmers and local communities. Provide support to strengthen production capabilities of small-scale producers of local foods with appropriate nutrient profiles through subsidized credits and technical support with production technologies.

ii. Identify and put in place mechanisms to re-introduce and promote backyard/homestead gardening of local/traditional fruits and vegetables, and where possible, integrated homestead gardening with fish farms and small animal management. Through the agriculture extension services, ensure the availability of seeds/saplings of varieties with high nutritional value.

iii. Promote and enhance urban agriculture and the production of local/traditional vegetables in particular, and ensure easy availability of seeds to interested groups and individuals.

iv. Promote the integration of genetic resources with appropriate nutrient profiles in large-scale agriculture policies and programmes at national and international level, including the private sector such as seed producers.

v. Support and promote initiatives such as school gardens/farms as vehicles for educating young people about the benefit of foods from specific varieties and breeds, including considering their institutionalization, so as to ensure their viability and sustainability.

vi. Promote the incorporation of foods from specific varieties, cultivars and breeds of plants and animals used as food, as well as wild, neglected and underutilised species into relevant nutrition activities (e.g. food composition, food-based dietary guidelines, nutrition education, dietary assessment and nutrition policy development), and into relevant agriculture activities (e.g. research, breeding, seed selection and production, large-scale production).

vii. Promote food-based approaches based on the use of different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species, to combat malnutrition.

viii. Support the establishment of market infrastructure for wild foods or for specific varieties and breeds with appropriate nutrient profiles in order to enable market access for these foods thereby engendering their easy availability to the population.

ix. Align mainstreaming initiatives with government priorities, as well as international mainstreaming efforts, e.g. of the CBD and other relevant intergovernmental processes.

C: AWARENESS

i. Support the development of national awareness campaigns[1] which include elements such as the establishment of "know your foods" radio talk shows, and television programmes that present the nutrition and health attributes of using foods from different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species, and their possible uses in everyday meals.

[1] FAO, 2011. "Let's Go Local" Guidelines for Promoting Pacific Island Food. Prepared by Dr. Lois Englberger

ii. Support the organization, at regular intervals, of initiatives such as policy advocacy workshops, round table discussions and stakeholder meetings to increase awareness of the public sector and of decision makers of the importance of food from different varieties, cultivars and breeds of plants and animals, as well as wild, neglected and underutilized species, and of its role in ensuring good nutrition and food security. Sectors related to agriculture, health, education, rural development, environment and finance are also important targets of these awareness initiatives.

iii. In collaboration with partners such as the FAO, universities, research institutes and farmers groups and associations, organize national and regional workshops that target the promotion of biodiversity for food and agriculture.

iv. Extend the existing FAO curriculum guide for nutrition education in primary schools to include curriculum for teaching biodiversity for food and agriculture from local/traditional food systems including aquatic and animal food resources, their uses in diets and their nutrition and health protecting and promoting attributes.

v. As an educational tool for young children and the population at large, promote and encourage the display on the cover of school textbooks, workbooks and exercise books, of pictures of local plant and animal breeds and varieties with short and easy to comprehend messages on their nutrition and health attributes, and arrange practical cooking and tasting sessions for children and their parents, to promote their integration into food preparation and eating patterns.

vi. Disseminate research results within the scientific communities of nutrition, agriculture, health and environment through, for example, conferences, web sites, scientific articles, and guidance documents.

vii. Organize special events related to biodiversity for food and agriculture such as fairs, festivals or a national ‘Traditional Biodiversity Food Day’. Often there are many organisations working on similar activities and initiatives and synergies can be developed through facilitating collaboration and networking.

APPENDIX D

VOLUNTARY GUIDELINES TO SUPPORT THE INTEGRATION OF GENETIC DIVERSITY INTO NATIONAL CLIMATE CHANGE ADAPTATION PLANNING

CONTENTS

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I. INTRODUCTION

1. The FAO Commission on Genetic Resources for Food and Agriculture (the Commission), at its Fourteenth Regular Session in April 2013, reaffirmed the importance of genetic resources for food and agriculture (GRFA) for coping with climate change and the need to raise awareness of their potential role. At the same session, the Commission adopted its Programme of Work on Climate Change and Genetic Resources for Food and Agriculture[1] and agreed on the development of guidelines for the integration of genetic diversity considerations into climate change adaptation planning.

2. Many countries will have already embarked on the development of plans to support the contribution of the conservation and use of GRFA to climate change adaptation. These plans are often linked to other national adaptation planning processes.

3. Within the United Nation Framework Convention on Climate Change (UNFCCC), the preparation of National Adaptation Programmes of Action has enabled least developed countries to identify and address urgent and immediate priorities with respect to adaptation[2] to climate change. To complement the short-term planning, the UNFCCC established the National Adaptation Plan (NAP) process and several countries have already embarked on the formulation of their NAP. This process encourages countries to advance from short-term and other individual adaptation experiences to comprehensive, medium- and long-term planning for adaptation. The NAP will be the primary statement of national adaptation needs and priorities. The objectives of the NAP process are (a) to reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience;[3] and (b) to facilitate the integration of climate change adaptation into relevant new and existing policies, programmes and activities.

4. The UNFCCC Least Developed Countries Expert Group prepared technical guidelines[4] which provide an overall approach that can be used by countries to identify and implement the adaptation measures that help respond to the effects of climate change. The guidelines presented in this document have the same structure as those prepared by the Least Developed Countries Expert Group, so that they can complement and contribute to the NAP process, addressing the genetic resources dimension of adaptation planning.

5. The guidelines seek to ensure the relevance of GRFA to the overall national adaptation planning process in a country by identifying clear goals for conservation and use of GRFA as part of national adaptation to climate change, and ensuring the fullest involvement of all stakeholders. The process allows the identification of well defined objectives and the development of plans to achieve these. In this way the guidelines can support the identification of priority areas for future investments in conservation and use of GRFA.

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[1] CGRFA-14/13/Report, *Appendix D*. See also: www.fao.org/nr/cgrfa/cross-sectorial/climate-change

[2] *Adaptation: human-driven adjustments in ecological, social or economic systems or policy processes, in response to actual or expected climate stimuli and their effects or impacts. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.* Definition as in UNFCCC 2012. NAP technical guidelines, p. 13: http://unfccc.int/files/adaptation/cancun_adaptation_framework/national_adaptation_plans/application/pdf/naptechguidelines_eng_low_res.pdf

[3] *Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity. Therefore adaptation would also include any efforts to address these components. Adaptive capacity (in relation to climate change impacts): The ability of a system to adjust to climate change (including climate variability and extremes) in order to moderate potential damages, to take advantage of opportunities or to cope with the consequence. Resilience: The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization and the capacity to adapt to stress and change.* Definitions as in UNFCCC 2012. NAP technical guidelines, p. 13.

[4] UNFCCC 2012. NAP technical guidelines: http://unfccc.int/adaptation/workstreams/national_adaptation_plans/items/6057.php

6. The guidelines build on, *inter alia*, previous work by the Commission on climate change, such as the Background Study Papers No. 53-57, 60, and information obtained through a global survey on *Lessons learned about the ways and means to conserve and use genetic diversity to build resilience to climate change in food and agriculture systems*[5]; and take account of the Global Plans of Action (GPAs) for plant, animal and forest genetic resources (see *Annex B*) and of relevant documents covering aquatic genetic resources[6]. They have been reviewed at an expert workshop and by the Commission's Intergovernmental Technical Working Groups on Animal, Forest and Plant Genetic Resources.

7. The guidelines take account of the characteristics of different GRFA which face different challenges and opportunities in respect to climate change. However, the guidelines also aim to take account of the interconnected and cross-cutting nature of many aspects of conservation and use of GRFA, and of the benefits of adopting an integrated approach.

II. RATIONALE

8. Tackling climate change is central to achieving a sustainable future for the world's growing population, and food security must lie at the heart of these efforts. Climate change presents significant threats and challenges to agriculture, forestry and fisheries. Rising temperatures, changing rainfall patterns, increasing climate variability and the greater frequency of extreme events present risks and increase vulnerability in production systems and natural ecosystems. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change[7] stressed that climate change is already having an impact on all aspects of food security, which suggests that the pace of adaptation needs to speed up.

9. The genetic resources that constitute biodiversity for food and agriculture include the variety and variability of animals, plants and micro-organisms that sustain the ecosystem structures, functions and processes in and around production systems, and that provide food and non-food agriculture products. The diversity found in and around production systems has been managed or influenced by farmers, pastoralists, forest dwellers and fisherfolk over many hundreds of generations and reflects the diversity of both human activities and natural processes. GRFA are the raw material that local communities and researchers rely upon to improve the quality and output of food production.

10. Climate change influences the extent and distribution of GRFA and the genetic diversity they possess. It threatens the continued existence of species, populations, varieties and breeds found in many parts of the world, and is changing the nature of the production systems in which these occur. At the same time, adaptation to climate change involves the increased use of the genetic diversity present in these resources to, *inter alia*, sustain agricultural production, support the continuing provision of ecosystem services and maintain livelihoods under changing conditions. Loss of GRFA or the failure to use their full potential limits the capacity of humankind to adapt to climate change. The importance of GRFA for climate change adaptation is highlighted in *Annex A*.

11. Climate change is an ongoing process and GRFA will have to be conserved and continuously mobilized to meet new challenges as conditions change over coming decades. Adaptation measures that make use of the full potential of GRFA need to become an integral part of national adaptation planning, linked to national development objectives and coordinated with the adaptation plans of agriculture, forestry, fisheries, the environment and health.

[5] CGRFA-15/15/Inf.16.

[6] FAO 1995. Code of Conduct for Responsible Fisheries; http://www.fao.org/docrep/005/v9878e/v9878e00.htm. FAO Technical Guidelines for Responsible Fisheries; Volume 5; Supplement 3; Aquaculture development; Genetic resource management: http://www.fao.org/docrep/011/i0283e/i0283e00.htm

[7] Intergovernmental Panel on Climate Change 2014. Fifth Assessment Report: http://www.ipcc.ch/

III. OBJECTIVES AND PRINCIPLES

OBJECTIVES

12. The objectives of the guidelines are:

i. To promote the use of GRFA in climate change adaptation and support their integration into national climate change adaptation planning;
ii. To support the genetic resources experts and those involved in climate change adaptation to identify and address the challenges and opportunities of GRFA in adaptation; and
iii. To promote the involvement of genetic resources stakeholders in the national climate change adaptation planning process.

PRINCIPLES

13. The process of integrating genetic diversity into national climate change adaptation planning, in accordance with the principles for the NAP process[8]:

i. Is not prescriptive. The guidelines are a voluntary instrument that may assist countries to undertake the steps and activities that can ensure effective adaptation. According to their level of progress in developing and implementing adaptation plans, countries can select which steps and activities to undertake in order to move forward;
ii. Seeks to enhance the coherence of adaptation and development planning within countries, rather than duplicate efforts;
iii. Facilitates country-owned, country-driven action. Countries have full ownership of the national adaptation planning process within their countries. The process seeks to harness and build upon national-level capacity, with support from various partners, as appropriate;
iv. Is designed so that countries can monitor and review it on a regular basis, and update their adaptation plans in an iterative manner. This is important, given that better quality climate data and projections, as well as other information useful for the planning process, will increasingly become available, and the impacts of climate change in the medium- and long-term will be better understood;
v. Is designed to identify gaps in capacity and adaptation on an ongoing basis, and to address these gaps.

14. The process also seeks to:

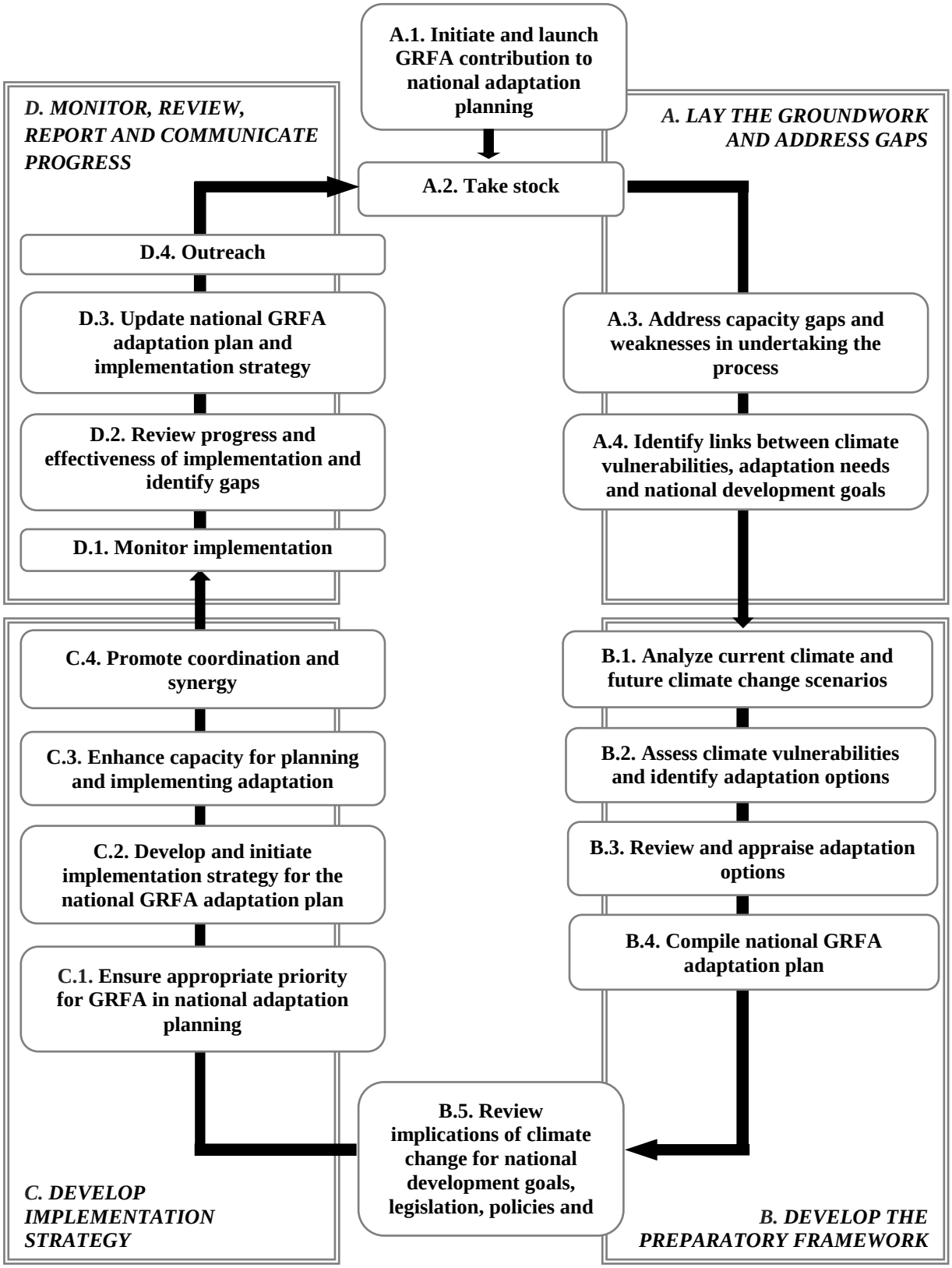
i. Integrate adaptation to climate change into GRFA sectoral national planning processes, strategies and monitoring processes;
ii. Adopt an inclusive approach that ensures the full participation of the many stakeholders involved in the conservation and use of GRFA. These are likely to include: relevant agencies, organizations and institutions; farmers, pastoralists, fisherfolk and forest dwellers and their representative organizations; traditional knowledge holders and scientists; and consumer groups;
iii. Take account of existing national efforts in the relevant GRFA sectors, build on national efforts to implement agreed GPAs and maximize synergies across GRFA sectors;
iv. Pilot approaches that promote an iterative process and be evidence based;
v. Reflect the international dimensions of GRFA and promote inter-country collaboration;
vi. Include measures that strengthen conservation, availability and use of GRFA and that reflect an ecosystem approach to GRFA management.

IV. ELEMENTS AND STEPS

15. To facilitate direct linkages with the NAP process, the guidelines follow the structure and approach of the NAP technical guidelines. The process involves four main elements in each of which a number of steps are proposed. The elements and steps should be seen as part of a connected iterative process where successes or failures are monitored and the results fed back into the process, as illustrated in Figure 1.

[8] UNFCCC 2012. NAP technical guidelines, p. 16

Figure 1. Elements and steps for integrating genetic resources for food and agriculture (GRFA) into national adaption planning



OVERVIEW OF ELEMENTS AND STEPS

16. The main activities that will be undertaken in the different steps are summarised below. The steps are described in greater detail in the following section.

ELEMENT A. LAY THE GROUNDWORK AND ADDRESS GAPS

A.1. Initiate and launch GRFA contribution to national adaptation planning
Establish the institutional arrangements needed to strengthen the role of GRFA in national adaptation planning. Strengthen the collaboration between, *inter alia*, animal, aquatic, forest and plant genetic resources sectors, identify entry points for GRFA in climate change adaptation planning and engage with climate change focal points and policy makers.

A.2. Take stock
Conduct a stock-taking including an analysis of the strengths, weaknesses, opportunities and threats (SWOT) of the current state of conservation and use of GRFA in the context of climate change adaption.

A.3. Address capacity gaps and weaknesses in undertaking the process
Use the SWOT analysis to identify gaps in country capacity to undertake the work needed to support the conservation and use of GRFA in the context of climate change adaptation.

A.4. Identify links between climate vulnerabilities, adaptation needs and national development goals
Ensure that GRFA conservation and use concerns identified during the stock taking process take adequate account of national development goals in relevant areas, such as food security, nutrition and health, rural development and environmental management.

ELEMENT B. DEVELOP THE PREPARATORY FRAMEWORK

B.1. Analyze current climate and future climate change scenarios
Review available information on climate change scenarios with respect to the expected impact on GRFA taking account of concerns of different genetic resources sectors and socio-economic implications for rural communities.

B.2. Assess climate vulnerabilities and identify adaptation options
Decide on the scope of the vulnerability and risk assessments and undertake them. Identify the expected impacts of non climate change related changes and the expected added impact of climate change on GRFA; identify and assess adaptation options and establish processes for monitoring and managing GRFA related risks.

B.3. Review and appraise adaptation options
Identify GRFA related adaptation options with respect to both conservation and use of GRFA. Review options against a set of agreed criteria and take account of ongoing or proposed adaptation plans in relevant areas (e.g. food production) that will require enhanced GRFA use.

B.4. Compile national GRFA adaptation plan
Develop national GRFA adaptation plan using a participatory iterative approach linked to overall national adaptation planning. Identify actions needed to support both conservation and use of GRFA, taking account of existing GPAs for genetic resources or other GRFA related plans and of the opportunities for coordinated actions across GRFA sectors.

B.5. Review implications of climate change for national development goals, legislation, policies and plans

Review national development goals, legislation and policies; identify synergies, possible conflicts or trade-offs between the national GRFA adaptation plan and other aspects of national adaptation planning.

ELEMENT C. DEVELOP IMPLEMENTATION STRATEGY

C.1. Ensure appropriate priority for GRFA in national adaptation planning

Describe the contribution that GRFA can make to national priorities and engage with policy makers at local and national levels to ensure appropriate priority is given to GRFA.

C.2. Develop and initiate implementation strategy for the national GRFA adaptation plan

Formulate the key elements of the implementation strategy including coordination mechanisms, prioritization criteria, pathways to achieving major outputs and outcomes, implementation procedures, stakeholder engagement, resource mobilization and mechanisms to support congruence with the NAP, GPAs for genetic resources and other strategic planning processes.

C.3. Enhance capacity for planning and implementing adaptation

Strengthen capacity to support implementation using a multi-faceted capacity development programme tailored to the needs of different interest groups (including farmers, fisherfolk, forest dwellers, policy makers, public administrators, and extension workers).

C.4. Promote coordination and synergy

Develop or strengthen links to appropriate regional and international processes and the activities that support them. Ensure effective links with programmes of relevant ministries, agencies and organizations including those involved in agriculture and food production, environmental protection, health, energy use and water management.

ELEMENT D. MONITOR, REVIEW, REPORT AND COMMUNICATE PROGRESS

D.1. Monitor implementation

Establish monitoring procedures and indicators and assess progress on implementing the guidelines and in achieving adaptation plan outputs and outcomes.

D.2. Review progress and effectiveness of implementation and identify gaps

Develop identified review process and use results of monitoring together with available new information on climate change and adaptation to review the progress and effectiveness in implementing the guidelines and national GRFA adaptation plan and to identify gaps and weakness in implementation.

D.3. Update national GRFA adaptation plan and implementation strategy

Update the national GRFA adaptation plan and the implementation strategy based on the results of monitoring and review, new information and the result of adaptation actions already implemented.

D.4. Outreach

Communicate results of implementing guidelines and national GRFA adaptation plan to policy makers, stakeholders and to wider public and provide inputs to relevant international processes.

DESCRIPTION OF ELEMENTS AND STEPS

ELEMENT A. LAY THE GROUNDWORK AND ADDRESS GAPS

17. This first element focuses on the steps needed to develop an appropriate conceptual and operational framework, to identify entry points for GRFA in national adaptation planning and ensure recognition by relevant policy making bodies of the importance of GRFA to adaptation.

A.1. Initiate and launch GRFA contribution to national adaptation planning

18. The following activities should be undertaken:

i. Initiate or strengthen collaboration between, *inter alia*, the animal, aquatic, forestry and plant genetic resources sectors;
ii. Identify and review existing arrangements for national adaptation planning;
iii. Engage with climate change focal points, planners, policy makers and with policy making processes to improve recognition of the potential contribution of GRFA to national adaptation;
iv. Identify existing entry points for GRFA perspectives and information within the national adaptation process and assess their effectiveness;
v. Identify and seek to establish institutional arrangements that ensure that relevant parts of the NAP are reflected in relevant GRFA plans and strategies and support:
    - Coordination and linkages between different organizations, agencies and ministries involved in conservation and use of GRFA and in climate change adaptation;
    - Analysis and assessment of vulnerability and risk and the identification of adaptation options;
    - Implementation actions that will be undertaken by a diversity of actors at national, regional and local levels;
    - Capacity development to ensure continuing ability to meet changing conditions;
    - Integration and mainstreaming of GRFA based options into climate change adaptation as well as climate change perspectives into GRFA maintenance and use; and
    - Development and implementation of a communication strategy to increase the visibility of GRFA.

19. An integrated approach that brings together GRFA sectors is likely to strengthen the effectiveness of the GRFA contribution and the wider recognition by policy makers of the value of GRFA in adaptation. At the same time, the arrangements developed will need to take account of the different characteristics of genetic resources and the institutions involved in their conservation and use. The approach adopted can build on existing GPAs, the collaborative arrangements developed to prepare country reports for *The State of the World's Biodiversity for Food and Agriculture* or other appropriate instruments and should take account of the different institutional arrangements that link GRFA sectors to national agricultural, environmental, health and planning entities or agencies.

A.2. Take stock

20. Integrating GRFA into national adaptation planning and developing a GRFA adaptation plan will require taking stock of the current situation with respect to climate change and the conservation and use of GRFA. The analysis should include assessments of the following:

i. Status of different GRFA sectors and associated biodiversity for food and agriculture, including current patterns of GRFA use and conservation e.g. *in situ* and *ex situ* (genebanks);
ii. Institutions and institutional arrangements that support the conservation and use of GRFA, including the roles of civil society organizations and of local and informal institutions such as local markets;
iii. The importance of international availability and flows of genetic resources for the country;
iv. Overall observed and expected impacts of climate change in the country;
v. Current or expected vulnerabilities to climate change;
vi. Relevant research on GRFA and climate change;
vii. Traditional knowledge on GRFA conservation and use relevant to adaptation;

viii. Past and ongoing adaptation actions;
ix. Actions or programmes relevant to adaptation such as those undertaken to implement the GPAs or to achieve the Aichi Biodiversity Targets.

21. Sources of information for stock-taking include national reports prepared for the global assessments[9] of the state of the world's plant, animal and forest genetic resources, national information systems and global systems such as the World Information and Early Warning System (WIEWS)[10] on plant GRFA, Domestic Animal Diversity Information System (DAD-IS)[11] and the Worldwide Information System on Forest Genetic Resources (REFORGEN)[12]. The experiences gained in the implementation of the GPAs will also constitute an essential element distilling past information and experience. Information on climate change vulnerability will come from national and international contributions to the Intergovernmental Panel on Climate Change and from national climate change assessments. International programmes such as the CGIAR Programme on Climate Change, Agriculture and Food Security will also provide relevant information, especially with respect to ongoing research.

22. The process of taking stock should involve an analysis of strengths, weaknesses, opportunities and threats (SWOT) that can inform and strengthen the activities developed under step A.1. above. The SWOT process will help identify priority concerns, capacity gaps and institutional barriers. A key aim will be to bring information together across GRFA sectors so as to create an overall GRFA perspective that takes full account of the different contributions to adaptation that can be made by different GRFA sectors. The SWOT will need to involve stakeholders from all GRFA sectors and from a range of different institutions and organizations. It should include organizations representing farmers, pastoralists, fisherfolk and forest dwellers but also other sections of civil society, the private sector, scientists and others professionally involved in agriculture, fisheries and forestry. The SWOT process will provide opportunities for these different groups to be fully engaged and to provide inputs based on their different experiences.

A.3. Address capacity gaps and weaknesses in undertaking the process

23. The stock-taking process and the SWOT analysis in A.2. allow identification of gaps and weaknesses in the capacity to undertake the different actions associated with conservation and use of GRFA in support of climate change adaptation. Such gaps and weaknesses may be institutional and technical in nature, may relate to the arrangements that can support the role of GRFA, or may relate to participation of stakeholders and the wider public. This step will involve addressing the identified institutional and technical gaps, which will include training activities that aim to provide the skills needed for key organizations to fully participate in different activities. Weaknesses in the available supporting arrangements may be addressed through the establishment of the necessary operating systems and by supporting policies and programmes. The capacity of genetic resources stakeholders and the wider public to engage in adaptation actions can be strengthened through appropriate communication activities and through participatory approaches that support the involvement of the widest range of stakeholders particularly farmers, pastoralists, fisherfolk and forest dwellers (see also step C.3.). The activities undertaken should be reflected in the institutional arrangements established under step A.1.

[9] FAO CGRFA: http://www.fao.org/nr/cgrfa/cgrfa-global/cgrfa-globass
[10] WIEWS: http://apps3.fao.org/wiews/wiews.jsp
[11] DAD-IS: http://dad.fao.org/
[12] REFORGEN: http://foris.fao.org/reforgen/

A.4. Identify links between climate vulnerabilities, adaptation needs and national development goals

24. The stock-taking process in A.2. also provides a basis for ensuring that the adaptation measures identified for GRFA take adequate account of national development goals. Relevant goals are likely to include improving food security and nutrition, rural livelihoods and incomes, sustainability, environmental health and strengthening national resilience. The ways in which GRFA contribute to these goals will need to be made explicit and the challenges and opportunities presented by climate change to securing the contribution of GRFA to these goals identified and described. Synergies between GRFA sectors in their contribution to development goals and opportunities for enhanced contributions should be placed in the national context and take account of the specific challenges faced by individual countries.

25. An important contribution to the success of this step will be an increasing awareness of policy makers of the value of GRFA. Policy relevant materials should be prepared and relevant policies that exist or will be needed should be identified. The GPAs and the reports on the state of the world's genetic resources provide guidance on enhancing the contribution of GRFA to food security and other relevant objectives and should be used to support the findings of the SWOT analysis in the preparation of such materials.

ELEMENT B. DEVELOP THE PREPARATORY FRAMEWORK

26. The objective of this element is to ensure that there is knowledge of climate change expectations, of the risks and threats involved and of adaptation options. Based on this knowledge, a national adaptation plan for GRFA conservation and use can be developed that ensures an effective contribution of GRFA to national adaptation planning.

B.1. Analyze current climate and future climate change scenarios

27. This step includes an assessment of the different available scenarios for future climate change. It should take account of the uncertainties that have been recognized and complement other national planning activities by focusing primarily on aspects likely to be of greatest relevance to GRFA conservation and use. It should consider the likely effects of different scenarios for different GRFA sectors and whether projected plans for the sectors (e.g. livestock production growth) remain realistic. The assessment should also consider socio-economic implications for rural communities and take account of existing government mitigation or carbon reduction plans.

28. Much of the work on climate change scenarios has been concerned with changes at global or regional scales. However, there is increasing evidence of the need to consider the consequences of climate change at more local levels. The different agro-ecological zones and production systems[13] present in a country may provide relevant and useful scales for the assessment process.

B.2. Assess climate vulnerabilities and identify adaptation options

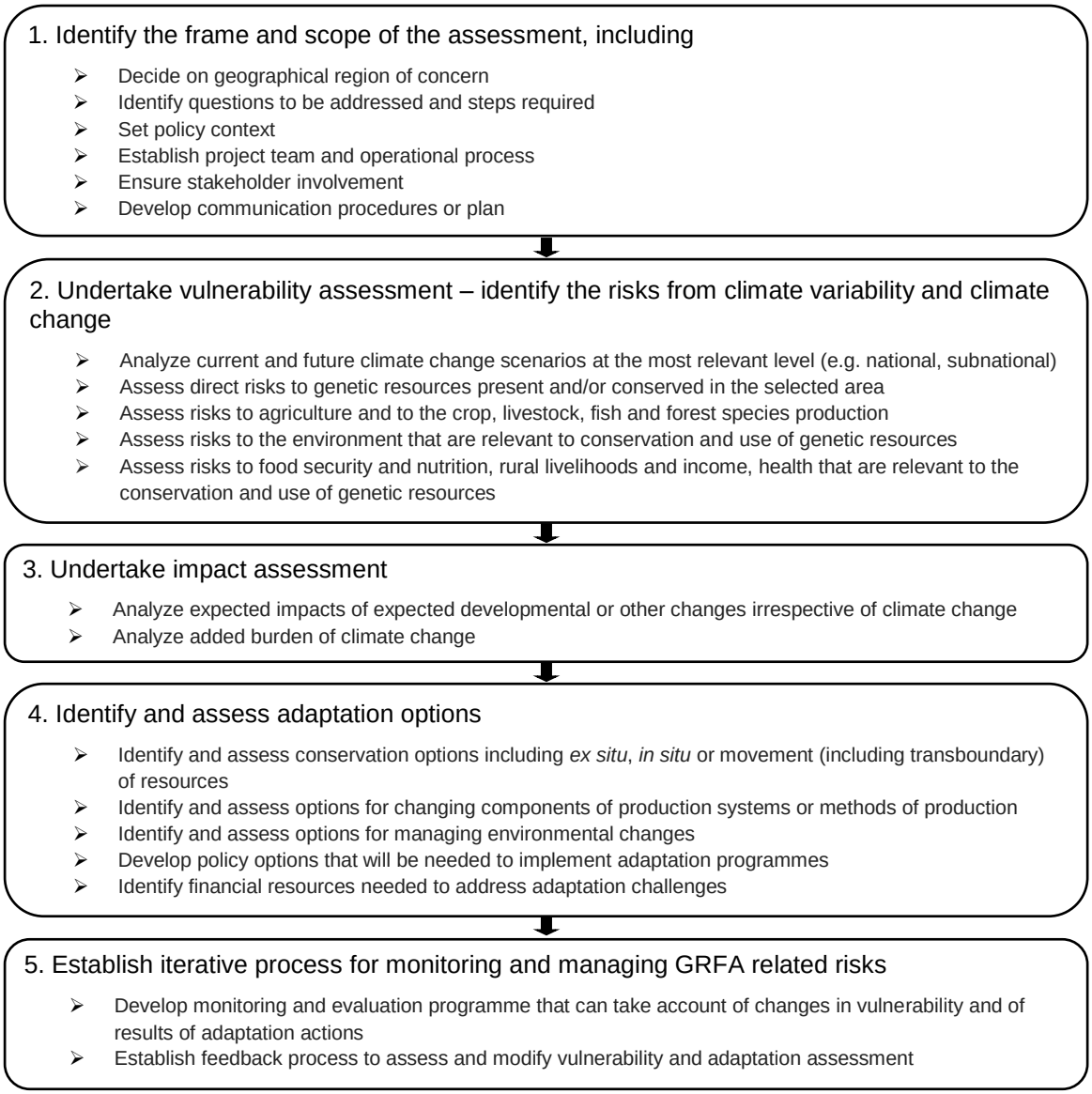
29. A list of different activities to be included in assessing risks and vulnerabilities and of identifying adaptation options is set out in Figure 2 and includes: deciding on the frame and scope of the assessment; undertaking the required vulnerability and risk assessments; identifying the expected impacts of other changes and the expected added impact of climate change; identifying and assessing adaptations options; and, establishing processes for monitoring and managing GRFA related risks. The

[13] Agro-ecological zones are homogenous and contiguous areas with similar soil, land and climate characteristics. See more at: http://www.fao.org/nr/gaez/programme/en/#sthash.CLjkW9wQ.dpuf

An appropriate classification of production systems has been developed for the preparation of the first report of the State of the World's Biodiversity for Food and Agriculture (Annex 2 of the Guidelines for the preparation of the country reports for *The State of the World's Biodiversity for Food and Agriculture* http://www.fao.org/fileadmin/templates/nr/documents/CGRFA/Guidelines_SOWBFA_E.pdf)

technical aspects of the assessment will require involvement of national research institutions and universities and should include expertise that cuts across GRFA sectors and can provide inputs on the possible consequences for food or water security or for health. The participation of farmers, pastoralists, fisherfolk and forest dwellers, their communities and organizations, and of the private sector should be actively encouraged and facilitated

Figure 2. Undertaking a vulnerability and adaptation assessment



30. The assessment should take account of risks to both conservation and use of GRFA. At-risk genetic resources that are not conserved cease to be available for future use and this may limit adaptation options. Risk and vulnerability assessment should evaluate risks to the genetic diversity within a production system, to the maintenance of key traits and to associated knowledge (particularly traditional knowledge).

31. In many cases information will be lacking with respect to the threats to particular resources or their potential for adaptation. The analysis should therefore use whatever information is available, identify major information gaps and identify ways in which missing information can be obtained and how it can be included as it becomes available. The ways in which existing national information management systems might be adapted for this purpose should be explored.

32. Risk and vulnerability assessment should take account of the inter-connected nature of many risks. This will involve exploring the nature and linked effects of many of the changes identified. For

example, changes in pest and disease distribution may increase the vulnerability of many species, populations, breeds or varieties that are also at risk from direct changes in temperature or rainfall patterns. An ecosystem approach that takes account of associated biodiversity is recommended. The different GRFA sectors may well have developed different methods to assess risk and vulnerability that they will wish to use, but should nevertheless seek to integrate their findings, using widely tested methods that can help inter-sectoral analysis where possible.

B.3. Review and appraise adaptation options

33. Once vulnerabilities and risks have been ranked, adaptation options must be identified to address them. Adaptation options involving GRFA may include management and operational strategies, infrastructural changes, policy adjustments or capacity-building and are likely to be of two main types – those that provide adaptation to specific directional change (e.g. increased temperature, more frequent occurrence of drought or flooding) and those that help cope with uncertainty (e.g. variable rainfall, fluctuating temperatures or the occurrence of extreme events). Adaptation measures may need to adopt an approach that addresses these different aspects. A key element will be the identification of measures designed to improve adaptive capacity that can help to ensure that further climate related change can be addressed.

34. Traditional knowledge will also make a significant contribution to identifying adaptation options. Local practices often constitute an important component of adaptation measures and the identification, assessment and compilation of these practices should be promoted with full participation of indigenous and local communities.

35. The ways in which existing national or international policies and legislation might affect the adoption of different adaptation options will need to be considered. This is particularly the case for regulations that govern access to, and exchange of, crop and livestock varieties and breeds, forestry species provenances or fish populations, while preventing the transfer of undesirable alien and invasive species. Policies that support the adoption of climate-friendly production will be particularly relevant, as will those that support sustainable intensification. Examples include policies that favour the increased use of agroforestry, the development of silvo-pastoral systems and the development of improved aquaculture practices using improved populations of fish species. Given the international character of conservation and use of GRFA, trade policies should also be included in the analysis.

36. Adaptation options that have been identified will need to be reviewed against a set of agreed criteria to prioritize the most promising measures for implementation. Important criteria for this evaluation include efficiency, effectiveness, equity, urgency, flexibility, robustness, practicality, legitimacy and co-benefits[14]. The evaluation should also include an assessment of the degree of uncertainty associated both with any identified vulnerability and with the likely effectiveness of any adaptation option.

B.4. Compile national GRFA adaptation plan

37. A national adaptation plan for conservation and use of GRFA will be needed in order to, *inter alia*, guide the contribution of GRFA to adaptation, help ensure the relevance of GRFA to national planning, provide an integrated an coherent programme of action and identify the scale of resources required. The plan should reflect the results of the assessment process, the analysis of policy dimensions and national goals. It will respond not only directly to specific adaptation planning but also to the longer-term aim of improving resilience, adaptability and sustainability in the country. It should identify the most urgent priorities and set out an approach that can take account of directional climate change, variability and of extreme events. The plan should be part of a country's overall national adaptation planning and, where relevant, be part of a country's NAP.

[14] For more information see: UNFCCC 2010. Assessing the costs and benefits of adaptation options: an overview of approaches: http://unfccc.int/resource/docs/publications/pub_nwp_costs_benefits_adaptation.pdf

38. The process of developing the national GRFA adaptation plan will be determined by the country, based on national context and needs and the nature of national GRFA institutions and programmes. The development of the plan should use an iterative approach that ensures participation of organizations representing farmers, pastoralists, fisherfolk and forest dwellers as well as other sections of civil society, women's groups, the private sector, scientists and those professionally involved in agriculture, fisheries and forestry. It should be cross-cutting and inclusive of perspectives from all GRFA sectors. The plan should involve a review of:

i. Existing patterns of use of genetic resources in agriculture and environment and the specificities of agriculture, forestry, fisheries in the country;
ii. Governance and collaboration mechanisms for GRFA in agriculture, fisheries and forestry;
iii. Capacity and capacity needs to support adaptation actions proposed;
iv. Vulnerability and adaptation assessments undertaken;
v. Ongoing monitoring and research programmes;
vi. Communication practices, opportunities and needs;
vii. Emergency preparedness and response; and
viii. Monitoring, evaluation and feedback procedures.

39. The plan should also take account of:

A. The contribution of the different GRFA sectors and complementarity between them
While each GRFA sector will identify adaptation measures that are relevant to their specific resources, the plan should adopt an integrated approach. Complementarities, synergies and trade-offs between GRFA sectors should be explored and the ways in which overall adaptation to achieve wider goals will require measures that involve different types of GRFA.

B. Existing GPAs or other GRFA relevant plans or guides
Many countries have already developed GRFA plans, which include actions relevant to climate change adaptation. International GRFA plans and guidelines also exist and identify priority actions of relevance, e.g. the GPAs. Relevant actions identified in these instruments should be embedded in the proposed national GRFA adaptation plan.

C. The different scales at which adaptation measures may be appropriate
Adaptation measures often involve intervention at different scales and, for example, be targeted at farm, village or community, landscape or country levels. Different types of adaptation reduce vulnerability and improve resilience at different scales and the plan should reflect the importance of interventions at all these levels.

D. The relative contribution of adaptation measures to conservation, availability and use of GRFA
The conservation, availability and use of GRFA are all essential aspects of adaptation to climate change and need to be embedded in any plan. The specific contribution of any planned measures to these different aspects will need to be identified to ensure that all are adequately addressed.

40. The plan should seek to identify not only the adaptation measures to be undertaken but also how they may be integrated and mainstreamed at country level. It will be a major planning tool to support the GRFA contribution to the country's NAP and will support effective communication with policy makers and a wider community of stakeholders that includes not only those involved in production but also consumers. Effective mainstreaming will require involvement of rural communities across the country and their inclusion in the development of the adaptation plan is therefore essential. It is recommended that the plan include an evaluation of the overall costs and capacity development needs for implementing the plan as well as an assessment of the likely benefits. The cost-benefit analysis should take account of wider social and cultural costs and benefits as well as providing economic estimates where these are possible.

B.5. Review implications of climate change for national development goals, legislation, policies and plans

41. The integration of GRFA adaptation planning into wider adaptation planning and the linkage to national development goals was initiated under Element A. The GRFA adaptation plan identified in B.4. should reflect that earlier process and will be a multi-year process involving different stakeholders ensuring that the plan reflects national needs and objectives and that these take account of potential GRFA contributions.

42. To facilitate the integration of GRFA adaptation planning into other planning processes, a review of the implications of climate change for national development goals, legislation, policies and plans should be conducted. The review should assess synergies, complementarities or possible conflicts with other aspects of national adaptation planning. Trade-offs need to be identified and the consequences explored with analysis of relevant costs and benefits where appropriate. This is likely to be particularly important in respect of the contribution of GRFA to wider societal goals such as nutrition or health and will need to take account of the consequences for GRFA of plans with respect to e.g. energy provision, transport or water management.

ELEMENT C. DEVELOP IMPLEMENTATION STRATEGY

43. The objective of this element is to develop a strategy to support the implementation of the national GRFA adaptation plan.

C.1. Ensure appropriate priority for GRFA in national adaptation planning

44. Determining the contribution of GRFA to adaptation in the broader context of national development planning will help policymakers and relevant stakeholders to recognize the importance of GRFA related adaptation measures given competing development needs. This will involve identifying national priorities and the criteria used to determine them and describing the contribution that can be made by GRFA to these priority actions. It will be important to engage with policy makers at local and national levels so as to understand the process of identifying priorities and the concrete actions that can be taken to ensure GRFA perspectives are included. The criteria used to evaluate adaptation options in B.3. will provide a relevant framework for identifying actions.

C.2. Develop and initiate implementation strategy

45. The implementation strategy that will be developed under this step describes the approach that can be used to deliver the objectives and outputs identified in the national GRFA adaptation plan. It will set out the mechanisms that can be used to secure implementation of the different activities identified in the plan, including the roles of different GRFA sectors, institutions and other stakeholders. The strategy will provide guidance on the ways in which new activities can be linked to ongoing initiatives that already support adaptation and establish how GRFA related initiatives will be linked to other national adaptation planning efforts in e.g. agriculture and food production, water management, health and energy use.

46. The strategy should be developed in cooperation with all relevant stakeholders (including scientists, extension workers, farmers, fisheries and forestry organizations, women's groups, relevant civil society organizations, breed societies and the private sector). It will need to identify the mechanisms that can ensure continuing involvement of appropriate stakeholders for specific measures.

47. Key elements that the strategy will need to address include that of securing adequate access to, and availability of, additional genetic diversity. Relevant activities in the GRFA adaptation plan are likely to include improving the availability of traditional breeds and varieties, provenances of forestry species likely to be more adapted to changed conditions and to populations of fish species with desirable adaptive characteristics. The strategy will need to take account of the fact that many of the resources needed may need to come from other parts of the world. Thus, it should contain explicit actions that facilitate movement of materials and support regional and international collaboration.

48. The strategy should fully reflect existing national strategies and plans for implementing the GPAs and the measures identified in these. Some of the most important activities whose implementation the strategy should support include: improving *in situ* and *ex situ* conservation; characterization and evaluation of conserved materials; introducing new species, populations, varieties and breeds; strengthening production system adaptability and resilience through diversification; improving the quality of supporting and regulating ecosystem services such as pollination, pest and disease control and water quality; developing better methods of accessing new diversity; and, breeding new crop, animal, forest and fish varieties and breeds and populations. Ways of building capacity, improving availability of materials and information and increasing awareness of the value of GRFA will also need to be integrated into the implementation strategy. *Annex B* lists some of the relevant actions identified in the GPAs for animal, forest and plant genetic resources. *Annex C* lists a selection of adaptation measures which the strategy may need to ensure can be implemented and indicates the outputs that can be expected from them.

49. Experience to date suggests that many countries face serious limitations with respect to mobilizing the resources needed to implement adaptation measures. The implementation strategy should therefore address resource mobilization. Elements are likely to include ways of mobilizing national financial resources, the use of international support through the Global Environment Facility and other international agencies, and ways of mobilizing private sector funding. Financial resources are not the only resources that can be mobilized in support of the implementation plan. Through public awareness campaigns and other methods opportunities may exist to develop publically supported monitoring programmes or community based testing programmes for new materials using e.g. crowd sourcing approaches.

C.3. Enhance capacity for planning and implementing adaptation

50. Strengthening capacity to support implementation will be essential. This involves developing an improved appreciation among the genetic resources and climate change stakeholders of the likely effects of climate change on conservation and use of GRFA and of the contributions to adaptation that GRFA can make. A multi-faceted capacity development programme tailored to the needs of different interest groups will be needed. Examples of appropriate capacity building activities might include:

i. Working with farmers, fisherfolk and forest dwellers in participatory ways to identify relevant actions based on their own experiences and establishing local monitoring processes;
ii. Strengthening the appreciation of the contributions of genetic resources among policy makers, public administrators in agriculture, environment and health; and
iii. Providing training to extension workers and local administrators to support measures that are part of the implementation plan.

C.4. Promote coordination and synergy

51. While many (or most) of the measures needed will be undertaken within the framework of GRFA sector programmes, a country level coordination mechanism should be established to oversee and coordinate implementation linked, where appropriate, to relevant NAP mechanisms. Since implementation will involve actions undertaken over a number of years, the coordination mechanism should be able to oversee and monitor progress on a continuing basis.

52. Cross-sectoral GRFA perspectives and links to other areas such as agriculture, environment and health should be included in developing regional or multi-country aspects of the implementation strategy. Such cooperative elements of the strategy should include full ownership of all projects by all the countries and regional entities concerned and broad inclusiveness and involvement of all relevant partners.

53. It is important to take full account of regional and international dimensions in developing implementation strategies. The distributions of many important species or populations are not limited to a single country and ensuring adequate access and availability of GRFA constitute an essential element in any implementation strategy. International agreements for access and benefit-sharing need

to be taken into account and a large variety of regional mechanisms exist that support the conservation and use of GRFA and whose work programmes include concerns with climate change adaptation.

ELEMENT D. MONITOR, REVIEW, REPORT AND COMMUNICATE PROGRESS

54. The objective of this element is to develop procedures to assess progress in implementation, to allow review and updating of the different elements and actions undertaken and to support communication of progress to all relevant stakeholders and to appropriate international bodies.

D.1. Monitor implementation

55. A set of quantifiable metrics will be needed for a satisfactory monitoring and evaluation process. These metrics should be well defined with clear collection procedures, understood by all those involved and linked with the country's other national adaptation monitoring and evaluation processes. Ideally, the metrics used should be relatively few in number, easy to collect on a continuing basis, and fit with other monitoring and review processes (such as those connected with monitoring GPAs progress or those towards achieving the Aichi Biodiversity Targets). They should clearly focus on assessing the conservation and use of GRFA in the context of climate change adaptation and include measures of change in risk and vulnerability.

56. Three levels of monitoring and evaluation can be usefully distinguished and included in the overall process:

i. *Monitoring the process*. There should be a clearly established process for monitoring the process of implementing the guidelines. This will need to be established under Element A and should include monitoring the extent to which GRFA related measures become part of the overall national adaptation planning.
ii. *Monitoring outputs*. Implementing the guidelines will result in a number of activities and adaptation measures and the extent to which these have achieved the desired outputs should be assessed.
iii. *Monitoring outcomes*. The extent to which implemented adaptation measures provide adaptation to perceived climate change is possibly the most complex and difficult part of the monitoring process. It is recommended that this monitoring process is fully integrated into the overall national adaptation monitoring process.

57. The indicators developed by FAO under the guidance of the Commission[15] provide a starting point for the process of developing an appropriate set to monitoring the adaptation measures adopted and can be combined with other indicators for monitoring the implementation of these guidelines.

D.2. Review progress and effectiveness in implementation and identify gaps

58. The implementation of these guidelines and of other related processes, such as the GPAs, will generate new knowledge on how best to conserve and use GRFA as part of national adaptation planning. The results of monitoring will also generate information on the extent to which different actions are successful in reducing climate change risks and vulnerabilities. New knowledge will also come from international research or adaptation efforts. A review of the findings from these different sources will contribute to assessing progress in implementation and identifying gaps where new actions are needed. An identifiable process should be established to ensure that the review is undertaken in a coordinated way on a regular basis with full stakeholder involvement. The analysis of new information and the findings and proposals from the review should be made public.

D.3. Update national GRFA adaptation plan and implementation strategy

59. Adaptation to climate change is a continuing process and there are many uncertainties with respect to the most appropriate adaptation measures to be adopted and the extent to which different

[15] FAO CGRFA: http://www.fao.org/nr/cgrfa/cross-sectorial/targets-indicators

measures deliver the desired adaptation. New risks and areas of vulnerability are also likely to emerge, requiring new actions.

60. The results of monitoring and of the review process should be used to make any appropriate modifications to the GRFA adaptation plan and its implementation strategy. The modifications may be needed to take account of the achievement of specific outputs, to reflect the effects of further changes in GRFA that reflect continuing climate change or to build on successful experiences from other relevant actions in the country or elsewhere.

D.4. Outreach

61. The findings from the monitoring and review and updates in the national GRFA adaption plan or implementation strategy should be communicated to all the relevant stakeholders involved. These include the management unit of the NAP at national level where this has been established, relevant ministries and international processes as well as other stakeholders. Reporting on progress made is an essential part of identifying best practices and of supporting mainstreaming. The outreach programme should be integrated into the communication strategy developed under step A.1.

62. Outreach plans and activities should not be limited to the communication of results to stakeholders. An integrated communication plan which ensures a continuing flow of information to policy makers and the wider public should be developed and form a continuing part of the work involved in implementing these guidelines.

ANNEX A

THE IMPORTANCE OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE FOR CLIMATE CHANGE ADAPTATION

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change concluded that climate change is affecting all aspects of food security and agriculture and that impacts on crop yields are already evident across several regions of the world. This suggests that the pace of adaptation needs to speed up.

Genetic resources for food and agriculture will play a central role in meeting the challenges of climate change to food security and nutrition, and in maintaining and improving agricultural productivity, rural livelihoods, sustainability and resilience. It is therefore essential to secure and mobilize these resources as part of national and global climate change adaptation planning.

The challenge of climate change

Climate change presents significant threats and challenges to agriculture, forestry and fisheries. Rising temperatures, changing rainfall patterns, increasing climate variability, rising sea levels and the greater frequency of extreme events all present risks and increase vulnerability in production systems. The changes that are occurring require new and different crop, animal, forestry and fish types in many, if not most, production systems. In parts of the world, new combinations of temperature, moisture availability and day length are creating production environments not experienced previously for which adapted materials may not exist. Sea level rise will result in the loss of many of our most productive areas or lead to increased salinity and loss in the productive capacity of important, often highly productive, production systems.

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change stressed that:

- Climate change is affecting the current abundance and distribution of freshwater and marine fish harvests.
- Recent price spikes for food have been related to climatic extremes in major production areas.
- Climate change has impacts on the nutritional quality and safety of food.
- Tropical crops, livestock and fisheries are most affected by current climate change; regions of major exposure to climate change coincide with high prevalence of poverty and food insecurity.
- Greater exposure to climate risks increases the vulnerability of food insecure individuals and households.

Genetic resources for food and agriculture

Genetic resources for food and agriculture include the variety and variability of animals, plants and micro-organisms that provide our food and non-food agriculture products and sustain the ecosystem structures, functions and processes in and around production systems. These resources have been managed or influenced by farmers, pastoralists, forest dwellers and fishers and gave humanity the possibility of coping with environmental and social changes over hundreds of generations. Genetic resources for food and agriculture provide the genetic diversity that will be needed for coping with climate change in a world of limited resources where improving sustainability and resilience become increasingly important.

Using genetic resources for food and agriculture to adapt to changing production environments

The crop varieties, animal breeds or fish and forest species populations that will be required for the changing climate conditions will have to come from the existing pool of genetic resources for food and agriculture. Increased tolerance to abiotic stresses (e.g. heat, drought, flooding, frost, rising water temperatures) will be needed and new varieties, breeds and populations adapted to higher production temperatures and to increased or decreased amounts of rainfall are already being developed around the

world. Some of the characteristics that will be needed are more complex or harder to predict. Increased temperatures and new rainfall patterns are changing pest and pathogen distributions and frequency and may alter the frequency and severity of epidemics, causing increased losses during food production or storage. New crop varieties, livestock, fish or forest species populations will often be needed and their development will depend on the successful conservation and use of genetic resources for food and agriculture. Changes are also occurring in the distribution and properties of pollinators and other species that make essential contributions to production through the ecosystem services they provide. Pollination was estimated to be worth €153 billion worldwide in 2015[16] and contributes to the yield and quality of at least 70% of the world's major food crops, especially many nutritionally significant fruit and vegetable crops[17]. New crop varieties, livestock, fish or forest species populations will be needed to take account of the changes that are occurring and provide the adaptive capacity needed for future change. Our ability to develop these new varieties will depend to a significant extent on how successful the conservation, characterization and use of genetic resources for food and agriculture will have been.

Adapting to increased variability

Adapting to the increasing variability in production systems that is being experienced in many parts of the world is more challenging still. Crop species and varieties, animals species and breeds, forestry and fish species and populations are needed that can cope with greater ranges of conditions than previously. In one year there may be rapid changes in available water and in another sudden changes in temperature. Year to year differences may also increase so that varieties, breeds or populations adapted to one year are less suitable the next. Traditional varieties and breeds are often considered to show the kind of adaptability needed to cope with these more variable conditions and to be adapted to a wider range of often sub-optimum production conditions than many modern varieties. In many cases, rural communities are already using traditional varieties and traditional knowledge to help adapt to the changing conditions they are experiencing.

Strengthening adaptive capacity

Climate change is a continuing process and adaptation will be a continuing process as temperatures continue to climb and other conditions continue to change. Even after (if) temperatures are stabilized, changes will continue to affect production systems over subsequent decades. The properties that are likely to become increasingly important in production systems include the potential to adapt to change over time (adaptive capacity), the capacity to provide different production benefits within a single system (option values), the ability of the different elements in a production system to compensate when conditions do not favour certain elements (complementarity and a portfolio effect) and the ability to bounce back after a series of climate challenges and develop new capacities in the face of change (resilience).

Securing the genetic diversity that will be needed

There are real dangers in assuming that just because genetic resources for food and agriculture are needed they will be there. Genetic resources for food and agriculture are also at risk from climate change. Some varieties, breeds and populations may no longer be able to adapt to the changed environments in the places they currently are found and additional conservation efforts are required.

Conserving and mobilizing genetic resources for food and agriculture to ensure that they are available and can be used to meet the challenges of climate change requires specific, focussed actions. The actions will need to include:

[16] Gallai, N., Salles, J.-M., Settele, J., Vaissière, B.E. 2009. Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. Ecol. Econ. 68: 810-821.

[17] Klein, A., Steffan Dewenter, I. and Tscharntke, T. 2003. Fruit set of highland coffee increases with the diversity of pollinating bees. Proceedings of the Royal Society, 270: 955-961.

- Effective conservation, *in situ* and *ex situ* of the varieties, breeds and populations of useful species, and of their wild relatives, that are at risk and that have the characteristics needed for climate change adaptation and mitigation;
- Improved information about genetic resources for food and agriculture and the characteristics of the different materials;
- Enhanced availability of genetic resources for food and agriculture within and between countries;
- Improved utilization pathways which allow for the development and distribution of new adapted materials and build on the roles that genetic resources for food and agriculture play in food security and nutrition, rural livelihoods, ecosystem services, sustainability and resilience.

Building sustainability and resilience

An essential aspect of adaptation to climate change will be that of increasing the diversity within production systems. This can take many forms: combining different types of production (crop, forest, fish and animal) in different ways; increasing the numbers of different species, populations, varieties or breeds, increasing the use of materials that are themselves genetically diverse such as crop multilines. These different approaches will help provide the complementarity, option values and risk avoidance strategies that will become increasingly important in the future. Finding ways to combine diversity rich strategies with the production demands of the future is one of the major challenges for the future and the improved maintenance and use of genetic resources for food and agriculture will lie at the heart of meeting this challenge.

A collaborative endeavour

Securing and mobilizing genetic resources for food and agriculture to support national and global adaptation planning is a collaborative endeavor. Already, through the work of the Commission on Genetic Resources for Food and Agriculture, the status of the resources is periodically assessed and monitored and Global Plans of Action have been developed for plants, animals and forest genetic resources that address climate change related issues in the conservation and use of genetic resources for food and agriculture (see *Annex B*)[18]. The "Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning" create a framework that can help build collaboration between all the different partners that need to be involved and ensure that genetic resources for food and agriculture make a full and effective contribution to national adaptation planning.

[18] For fisheries see FAO 1995. Code of Conduct for Responsible Fisheries; http://www.fao.org/docrep/005/v9878e/v9878e00.htm.
FAO Technical Guidelines for Responsible Fisheries; Volume 5; Supplement 3; Aquaculture development; Genetic resource management: http://www.fao.org/docrep/011/i0283e/i0283e00.htm

ANNEX B

THE GLOBAL PLANS OF ACTION FOR ANIMAL, FOREST AND PLANT GENETIC RESOURCES - SELECTED ACTIONS OF RELEVANCE TO THE IMPLEMENTATION OF THE GUIDELINES

The Commission on Genetic Resources for Food and Agriculture (Commission) negotiates Global Plans of Action (GPAs) that seek to create an efficient system for the conservation and sustainable use of genetic resources for food and agriculture. GPAs are intended as comprehensive frameworks to guide and catalyze action at community, national, regional and international levels through better cooperation, coordination and planning and by strengthening capacities. They contain sets of recommendations and priority activities that respond to the needs and priorities identified in global assessments: the reports on the state of the world's genetic resources for food and agriculture. GPAs are adopted by the relevant Governing Bodies of FAO, i.e. the FAO Conference or the FAO Council, or by special intergovernmental conferences convened at their request. The Commission oversees, monitors and evaluates the implementation of the GPAs.

i) The Global Plan of Action for Animal Genetic Resources

In 2007, the International Technical Conference on Animal Genetic Resources for Food and Agriculture, held in Interlaken, Switzerland, adopted the *Global Plan of Action for Animal Genetic Resources*[19] and the Interlaken Declaration. The outcomes of the Interlaken Conference were subsequently endorsed by the FAO Conference as a major contribution to the overall international framework on agricultural biodiversity. The FAO Conference requested the Commission to oversee and assess the implementation of the GPA. In 2009, the Commission adopted the Funding Strategy for the implementation of the GPA for animal genetic resources.

The different Strategic Priority Areas in the GPA list a number of actions relevant to the conservation and use of animal genetic resources. In the context of climate change, these include[20]:

Strategic Priority Area 1. Characterization, inventory and monitoring of trends and associated risks

- identifying potential climate change-related threats to specific animal genetic resources, ensuring that long-term threats (e.g. gradual environmental changes) are monitored and that urgent action is taken to address immediate threats (e.g. small populations at severe risk from climatic disasters);
- improving knowledge of breeds' current geographical distributions and production environments to support the above actions and to facilitate planning of climate-change adaptation measures and animal genetic resources conservation strategies;
- improving the availability of the above-described knowledge, including via DAD-IS and other animal genetic resources information systems;
- ensuring that monitoring strategies and early-warning systems for animal genetic resources are sensitive to climate-change-related trends and risks.

Strategic Priority Area 2. Sustainable use and development

- reviewing and, if necessary, adapting breeding goals to account for the effects of climate change.

[19] FAO CGRFA 2007. Global Plan of Action for Animal Genetic Resources: ftp://ftp.fao.org/docrep/fao/010/a1404e/a1404e00.pdf

[20] The examples are extracted from FAO CGRFA 2011 Background Study Paper 53, in which selected activities of the GPA are placed in the climate change context (http://www.fao.org/docrep/meeting/022/mb386e.pdf)

Strategic Priority Area 3. Conservation

- ensuring that conservation strategies account for the observed and projected effects of climate change, including agro-ecological changes and disaster risk, and if relevant the effects of climate change mitigation policies;
- ensuring that *ex situ* collections are sufficiently comprehensive, well managed and well located to provide insurance against climatic and other disasters (incl. establishing backup samples).

Strategic Priority Area 4. Policies, institutions and capacity-building

- ensuring that national strategies and action plans for animal genetic resources account for the effects of climate change and can be reviewed and amended as necessary to account for future climate-related developments;
- promoting exchange of information on climate-change adaptation strategies for livestock systems and animal genetic resources management, relevant breed adaptations and breed performance in specified production environments;
- improve use of transboundary breeds, especially regional breeds which are well adapted to harsh environments

ii) The Global Plan of Action for Forest Genetic Resources

The *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources*[21] was agreed upon by the Commission at its Fourteenth Regular Session and adopted by the FAO Conference in 2013. Priority areas for action include improving the availability of, and access to, information on forest genetic resources; *in situ* and *ex situ* conservation of forest genetic resources; sustainable use, development and management of forest genetic resources; and policies, institutions and capacity building.

One strategic priority of the GPA specifically addresses issues of climate change and forest genetic resources.

Strategic Priority 14. Support climate change adaptation and mitigation through proper management and use of forest genetic resources

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

Action: Develop subnational, national and regional standard methods and guidelines for the identification, selection and use of species population conservation units, based on environmental and sociocultural factors, which are the main determinants of the status of forest and agroforestry ecosystem diversity.
Assist countries in their efforts to improve the conservation and sustainable use of forest genetic resources in the face of climate change by:

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

[21] FAO CGRFA 2013. Global Plan of Action for Forest Genetic Resources: Appendix F in CGRFA-14 Report www.fao.org/docrep/meeting/028/mg538e.pdf

iii) The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture

The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture[22] is a strategic framework for the conservation and sustainable use of plant genetic diversity. It was adopted by the FAO Council in November 2011 and reaffirms the commitment of governments to the promotion of plant genetic resources as an essential component of food security through sustainable agriculture in the face of climate change.

The introduction to the GPA identifies the following strategic elements to safeguard plant genetic resources for food and agriculture and use them optimally to help cope with climate change[23]:

- Greater emphasis on *in situ* conservation of genetically diverse populations, especially crop wild relatives, to allow evolution to continue and thus permit the continued generation of adaptive traits;
- A significantly expanded programme on *ex situ* conservation, especially of crop wild relatives, to ensure the maintenance of diversity of species, populations and varieties, including those adapted to extreme conditions and those from areas expected to be highly affected by climate change;
- Increased research and improved availability of information on the characteristics of material held *ex situ* that will become useful under new climatic conditions;
- Increased support for access to and movement of plant genetic resources for food and agriculture to meet the greater interdependence of countries resulting from new environmental conditions;
- More support for building capacity in plant breeding and seed-systems management that make effective and sustainable use of plant genetic resources for food and agriculture;
- Targeted and increased involvement of farmers and farming communities in national and local crop-improvement activities, including support for participatory research and plant breeding.

These elements are included in the relevant Priority Activities of the GPA.

[22] FAO CGRFA 2009. Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture: http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr/gpa/en/
[23] *ibid.* paragraph 10

ANNEX C

INDICATIVE ACTIVITIES FOR CONSIDERATIONS IN IMPLEMENTATION PLAN

Indicative activities	Indicative outputs
i) Conservation	
Prioritize species, varieties, breeds and populations (including useful wild relatives) for conservation on the basis of climate change expectations, including both species of direct socio-economic importance and associated species relevant to provision of ecosystem services (hereafter "targeted and associated species")	Priority species (also "targeted and associated species") and conservation actions defined
Collect information on distribution and frequency of priority species, crop varieties, animal breeds and forestry and fish populations; identify risks and vulnerabilities from current or future climate change for both targeted and associated species	Species, varieties, breeds and populations at risk identified for targeted and associated species
Collect scientific and traditional knowledge relevant to adaptation and use of species, varieties, breeds and populations	Current and potential use in adaptation identified
Develop or agree on standard methods for the identification, selection and use of potentially valuable material of targeted and associated species, populations, varieties and breeds in context of climate change	Standard methods defined and in use
Develop and implement *ex situ* conservation plans for targeted and associated species, populations, varieties and breeds (including wild relatives) and strengthen information systems to respond to needs of climate change adaptation options	Species, populations, varieties and breeds conserved *ex situ* and information on *ex situ* conserved material available
Strengthen passport data contained in *ex situ* collections by improving eco-geographic characterization and characters relevant to adaptation.	Eco-geographic and other characteristics relevant to adaptation to climate change available for *ex situ* conserved materials
Develop and implement *in situ* conservation plans for targeted and associated species, populations, varieties and breeds (including wild relatives)	Species, varieties, breeds and populations conserved *in situ*
Identify agro-ecological systems that incorporate high levels of biological diversity and develop and implement mechanisms to maintain them	Priority agro-ecological systems where GRFA are likely to continue to evolve in response to climate change identified and supported (e.g. GIAHS sites)
Establish monitoring programmes at national, sub-national and community levels to assess levels of risk and vulnerability of targeted and associated species, populations, varieties and breeds and to measure the effectiveness of the conservation measures put in place	Ongoing information on risks and vulnerability

Indicative activities	Indicative outputs
ii) Improve production system adaptability and resilience	
Identify and strengthen community institutions related to management of GRFA; strengthen involvement of local communities in adaptation planning with emphasis on involvement of women and support for use of traditional knowledge	Stakeholders of adaptation actions identified at local level; Increased adoption of adaptation actions at local level; increased involvement of women; Mainstreamed participatory monitoring of climate change impacts and evaluation of potentially adapted crops, livestock, fish, trees, bio-control agents; Community access to technologies: to monitor climate change and impacts; and to identify, enhance and use GRFA useful for adaptation measures
Create or strengthen links between local, national and international organizations involved in adaptation planning and implementation using GRFA	Improved partnerships between community organizations and specialist organizations addressing climate change and agriculture issues
Develop policies and increase investments to support the identification, availability and use of adapted GRFA and of increased diversity	Direct and indirect support for the development and use of biodiversity in agricultural production at farm and landscape levels; Investments in research and development; Reforms to access and benefit sharing, quality control, marketing, insurance regulations, etc., to support availability and use of GRFA diversity
Identify and put in place measures to support diversification of production systems at landscape, village or community and farm levels. Actions can include support for: • agroforestry and enhanced use of perennial species; • introduction of new crops; • introduction of new animal species and breeds; • mixed plantings in forestry; • maintenance of mixed populations and introduction of new materials in fisheries.	Measures identified and in place aiming at improved adaptability, sustainability and resilience in production systems; Improved livelihood options for producers

Indicative activities	Indicative outputs
ii) Improve production system adaptability and resilience (cont'd)	
Support the protection and restoration of diverse production systems with the aim to reduce vulnerability and enhance resilience. Actions can include support for: • increased use of traditional varieties and breeds; • agroforestry and maintenance of traditional forestry areas; • traditional fisheries management practices.	Measures to support and maintain ecosystem functions and services identified and implemented
Support adoption of improved soil management practices based on improved management and use of soil organisms e.g. through no till practices, Conservation Agriculture and other relevant soil management techniques	Practices for improved provision of ecosystem services especially soil properties implemented
Assess effectiveness of provision of pollination services, identify risks and vulnerabilities with respect to climate change and implement measures to maintain or improve pollination e.g. support for bee keeping, provision of materials	Production of pollination dependent species maintained or enhanced; Local income-generation opportunities created
Support increased contribution of GRFA to water management (quality and quantity) at landscape, village or community and farm scales through support for appropriate fish resources management, riparian corridors, appropriate management of aquatic plants etc.	Measures put in place for improved quality and quantity of water
Support research on use of GRFA to improve adaptability and resilience; Review, use and improve relevant technologies	Knowledge on GRFA contribution to adaptability and resilience enhanced
Strengthen innovation pathways through improved capacity and accessibility	Response to climate change enhanced
iii) Improve specific adaptation of crops, domestic animals, forest tree and aquatic species	
Identify major threats to crop and animal production	Main climate change related threats to crop and animal identified
Identify adapted country GRFA or with potential for adaptation to threats for major crops, animals, tree and fish species through evaluation and characterization	GRFA identified for breeding or introduction programmes
Develop and implement crop, animal, tree or fish species improvement programmes to provide materials adapted to climate change e.g. through: • improved tolerance of abiotic stresses; • increased capacity to cope with variability production systems; • adaptation to changing production conditions and practices. Programmes should favour maintenance of a broad genetic base and include specific useful traits for climate change adaptation. Programmes should also include participatory breeding initiatives.	Increased availability of breeds, varieties or populations adapted to changed conditions.

Indicative activities	Indicative outputs
iii) Improve specific adaptation of crops, domestic animals, forest tree and aquatic species (cont'd)	
Identify, test and develop potential new crops or currently minor and neglected crops, animals, forestry or fish species with climate change adaptation potential	Increased range of useful materials available for production systems that can support diversification, livelihood improvement, adaptability and resilience
Provide long-term support for evaluation and use of wild relatives	Increased diversity available to breeding programmes
Support community programmes for the reintroduction maintenance and improvement of traditional varieties and locally adapted breeds	Improved community ability to cope with climate change; Improved conservation and use of traditional varieties and locally adapted breeds; Adaptability, sustainability and resilience of production systems improved
Improve the connection between the enhancers/improvers and the users of GRFA, by supporting extension services and/or other mechanisms for the exchange of information and technologies	Improved awareness of needs of users and improved response to those needs; Increased mainstreaming of adapted materials and of appropriate technologies
iv) Availability and accessibility	
Put in place appropriate mechanisms to facilitate access and benefit sharing, in agreement with existing national and international legislation	Appropriate mechanisms for access and benefit sharing in place;
Establish and support community conservation and sharing systems and practices	Local communities have direct access to adapted materials
Improve GRFA information systems and access to them	Identification of potentially useful GRFA facilitated
Improve within and between country methods for cooperation to identify, enhance and use GRFA for adaptation, including through transfers of GRFA, information sharing and transfers of related technologies	Availability of potentially useful GRFA and relevant information improved

Indicative activities	Indicative outputs
v) Supporting actions	
Develop continuing stakeholder involvement programmes and increase participation of all relevant agencies, organizations, societies, civil society groups, communities and producers including women at all levels	Strengthened involvement of all actors in adaptation actions
Create linkages between genetic resources databases and climate change scenarios to improve identification of potentially vulnerable or useful species, populations, varieties and breeds	Identification of potentially vulnerable or useful GRFA improved
Engage with and inform policy makers on the importance of GRFA in adaptation	Increased recognition of importance of GRFA at policy level
Undertake public awareness actions to improve understanding by society of the importance of GRFA to climate change adaptation; specifically engage with major civil society organizations (church, trade unions etc.) and the private sector involved in food production	Increased recognition of importance of GRFA at national level
Support training, extension, exchange programmes, farmers schools and other activities aiming to strengthen the capacity of GRFA workers and rural communities on implementing adaptation plans and actions	GRFA workers able to undertake effective adaptation implementation activities
Identify and mobilize resources and finance	Implementation measures adequately supported

APPENDIX E

STRATEGY FOR THE IMPLEMENTATION OF THE GLOBAL PLAN OF ACTION FOR THE CONSERVATION, SUSTAINABLE USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES

OBJECTIVE

The aim of this Implementation Strategy is to identify tools and mechanisms through which the Commission can support and strengthen the implementation of the *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources* (GPA FGR), adopted by the FAO Conference at its 38th Session in June 2013.

The Strategy should take into account and be consistent with the work of the Committee on Forestry of FAO as well as the relevant international instruments and ongoing processes related to forests.

AIMS OF THE GLOBAL PLAN OF ACTION FOR THE CONSERVATION, SUSTAINABLE USE AND DEVELOPMENT OF FOREST GENETIC RESOURCES

As stated in its paragraph 16, the aims of the GPA FGR are:

- to strengthen understanding and knowledge of forest genetic resources (FGR);
- to promote the sustainable use and management of FGR;
- to develop and strengthen *in situ* and *ex situ* FGR conservation programmes through collaboration at national, regional and global levels;
- to promote access to, and sharing of, information on FGR at regional and national levels;
- to create and strengthen national programmes to increase regional and international cooperation, including in research, education and training on the use and sustainable management of FGR, and to enhance institutional capacity;
- to assist countries, as appropriate, to integrate FGR conservation and management needs into wider national policies and programmes and frameworks of action at national, regional and global levels;
- to promote the assessment of FGR-related traditional knowledge, innovations and practices, the equitable sharing of benefits arising from their use, the recognition of their roles, and, where appropriate, the putting in place of effective policies and legislation addressing these matters;
- to promote adequate access to, and use of, quality forest reproductive material to support research and development programmes at national and regional levels and in line with the international laws and regulations regarding intellectual property;
- to promote ecosystem and ecoregional approaches as efficient means of promoting sustainable use and management of FGR;
- to assist countries and institutions responsible for the management of FGR to establish, implement and regularly review national priorities for the sustainable use and management of FGR; and
- to strengthen national programmes and enhance institutional capacity – in particular, in developing countries and countries with economies in transition – and develop relevant regional and international programmes. Such programmes should include education, research and training to address the characterization, inventory, monitoring, conservation, development and sustainable use of FGR.

MONITORING AND REVIEW OF THE IMPLEMENTATION STRATEGY

The Commission will monitor the execution of and review and revise this implementation strategy, as necessary and appropriate, to respond to gaps and needs in the implementation of the GPA FGR.

IMPLEMENTATION STRATEGY AREAS

This Implementation Strategy foresees specific action in the following areas:

- Advocacy and international awareness;
- Development and support of relevant global and regional networks;
- Supporting countries in the development of national and regional strategies for the implementation of the GPA FGR;
- Supporting countries in securing adequate and sustainable funding for the implementation of the GPA FGR;
- Development of international technical standards for FGR and support to implement them;
- Funding strategy for the implementation of GPA FGR; and
- Monitoring and reporting on the implementation of the GPA FGR and the status and trends of FGR.

I. Advocacy and international awareness

Strategic Priority 26 requires advocacy measures and tools to be developed at international level to ensure effective communication and information sharing related to the conservation sustainable use and development of FGR.

The first report on *The State of the World's Forest Genetic Resources*, as well as the Synthetic Account[1] are important communication and awareness-raising tools. However, it will be important to develop a communication strategy that communicates within a common overarching framework the essential value of FGR and the need to take action for their sustainable management and use to (1) policy makers and (2) forestry technicians and administration managers.

ACTION: The Commission invites FAO to develop a communication strategy and tools to ensure effective communication and information sharing related to the conservation sustainable use and development of FGR. In collaboration with its partners, FAO will contribute to the training of forestry technicians and administration managers, subject to the availability of financial resources.

II. Development and support of relevant global and regional network

Strategic Priorities 24 and 25 encourage the establishment and strengthening of regional and global networks.

Regional coordination is needed, recognizing that gene flow does not stop at national borders and many issues are best addressed across countries. The FAO Regional Forestry Commissions should play an important role in this regard. Regional intergovernmental institutions/processes such as Forest Europe, the Central Africa Forests Commission (COMIFAC), the Secretariat of the Pacific Community (SPC), and the Amazon Cooperation Treaty Organization have an important role and mandate in sustainable forest management at the regional level. They will need to play a key role in the implementation of the GPA-FGR, including by facilitating its integration, as considered relevant, into regional strategies and programmes. Regional networks (e.g. EUFORGEN, SAFORGEN, LAFORGEN, APFORGEN) are well placed to enhance coordination and collaboration between

[1] FAO 2014. The State of the World's Forest Genetic Resources – Synthetic Account.

research institutions, on technology, monitoring, *in situ* and *ex situ* conservation, awareness raising, policy implementation, resource mobilization and information sharing.

Regional networks may play an essential role for the implementation of the GPA FGR by:

- Promoting efficient monitoring and reporting on the status FGR for transnational species;
- Coordinating risk assessments and conservation measures for regionally important species;
- Identifying research needs and planning and developing joint project proposals;
- Acting as an independent "honest broker" to facilitate bilateral and multilateral cooperation among countries and for mobilizing funds for tasks;
- Developing and maintaining regional databases for FGR;
- Encouraging and promoting genetic improvement programmes and domestication for valuable tree species as a component of forest conservation and as a contribution to livelihoods;
- Building consensus on regional issues and policies affecting FGR;
- Promoting awareness of FGR issues within regional organizations and forums; and
- Strengthening the voice for the region in international discussions on FGR conservation and management.

ACTION: The Commission encourages international and regional networking and requests FAO, in collaboration with its partners, to support and strengthen existing networks subject to the availability of the necessary resources, including through series of workshops and the identification of best practices of information sharing, regional and global networking, which enhance coordination and collaboration on technology, monitoring, *in situ* and *ex situ* conservation, awareness raising, policy implementation, resource mobilization and information sharing. The Commission further recommends that FAO identify strategic partners, including international organizations, relevant centers of the Consultative Group on International Agricultural Research (CGIAR) and other research organizations and NGOs, to play a facilitation role in the implementation of specific strategic priorities.

III. Supporting countries in the development of national and regional strategies for the conservation, sustainable use and development of forest genetic resources

Strategic Priority 18 explicitly recognizes the importance of national strategies for *in situ* and *ex situ* conservation of FGR and their sustainable use. The GPA FGR provides an agreed international framework for efforts to enhance the sustainable management and use of FGR. The aim is clear: to support the sustainable use and management of FGR to ensure that forest trees can survive, adapt and evolve under changing environmental conditions in order to meet present and future challenges of food security, poverty alleviation and sustainable development.

National Forest Programmes provide effective means to translate the GPA FGR and the international momentum that has been created into national actions needed to ensure the implementation of the GPA FGR. These programmes should be part of an overall strategic process that sees the GPA FGR as the overarching framework and, as appropriate, Regional and National Strategies and Action Plans. This process may provide a basis for identifying the national, regional and global interventions that will most effectively mobilize and use financial resources for capacity building in forest genetic resources management.

Regional and national strategies and action plans may include, but not be limited to: Identifying regional and subregional priorities within the GPA-FGR; establishing and/or strengthening monitoring systems and evaluating status and threats to FGR; appointing national focal points and stakeholder committees overseeing the implementation of the GPA FGR and reporting to the Commission.

ACTION: FAO is requested to develop Guidelines for the preparation of National Forest Programmes, as well as regional and national strategies and action plans for the conservation, sustainable use and development of FGR, for review by the Working Group and the Commission at their next sessions, and, as appropriate, to develop synergies with other relevant instruments and strategies such as the National Biodiversity Strategy and Action Plan (NBSAP).

IV. Support countries in securing adequate and sustainable funding for the implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources

Strategic Priority 27 calls for assistance to countries and stakeholders to design appropriate programmes for the conservation, sustainable use and development of FGR and to secure adequate and sustainable funding.

Information on donor mandates, policies, eligibility criteria, and procedures for submitting funding proposals may help countries to more effectively mobilize financial resources and to secure funding from sources previously not available. Such information could be collected and maintained by FAO and made available to the Members of the Commission.

ACTION: FAO is requested to collect, maintain and regularly update on its web site information on donor mandates, policies, eligibility criteria, and procedures for submitting funding proposals for the conservation, sustainable use and development of FGR, subject to the availability of funds. FAO is further requested to inform donors, as appropriate, of the importance and role of FGR in contributing to solving important global issues such food insecurity, land degradation and climate change effects and to put efforts in joint project development and implementation.

V. Development of international technical standards for the conservation, sustainable use and development of FGR and support to implement them

Strategic Priority 3 calls for the development of international technical standards, protocols and indicators for FGR inventories, characterization and monitoring of trends and risks. A set of proposed indicators for assessing the status and trends of FGR can be found in the FAO thematic study on indicators,[2] however more work is still necessary to further develop indicators and to make them operational.

ACTION: FAO is requested to strengthen collaboration with relevant partners, including the CGIAR centres, and to further develop, subject to the availability of the necessary funds, international technical standards, protocols and indicators for assessing the status and trends of FGR and for the characterization and monitoring of trends and risks within national forest inventories and other forest-related programmes. Where possible, indigenous peoples and local communities and smallholders should be involved in the technical standards development process.

VI. Funding strategy for the implementation of the GPA FGR

While the GPA FGR does not call for the establishment of a funding strategy for the implementation of the GPA FGR, its effective implementation, in particular in developing countries, will depend on the availability of additional financial resources. In establishing such a funding strategy, the Commission may wish to consider the need for and modalities of a common overarching framework for funding mechanisms for all genetic resources.

ACTION: FAO is requested to prepare a draft Funding Strategy for the Implementation of the GPA FGR, including procedures for the use of resources made available to a FAO Trust or Special Fund

[2] Graudal, L. et al. 2014. *Indicators of forest genetic diversity, erosion and vulnerability*. Thematic Study for The State of the World's Forest Genetic Resources. Rome, FAO (In press).

that may be established for the purpose of supporting countries in the implementation of the GPA FGR.

VII. Monitoring and reporting on the implementation of the GPA FGR and the status and trends of FGR

The Second Report on the State of the World's Forest Genetic Resources is currently scheduled for 2022/23 (CGRFA-19)[3]. Between now and then, countries/ focal points should report in regular intervals on their implementation of the GPA FGR. National programmes, strategies and action plans for the implementation of the GPA FGR should be made available by FAO on a dedicated web site. In addition, status of implementation reports and reports on the status and trends of FGR should be uploaded by countries (or their national focal points) on a dedicated web site every five years. On the basis of country reports received, FAO will publish status and trends reports, for review by the Working Group and the Commission.

ACTION: FAO is requested to provide, for review by the Working Group and the Commission, at their next sessions, a draft Schedule and guidelines in line with the approved indicators, for monitoring and reporting on the Implementation of the GPA FGR.

[3] See CGRFA-14/13/Report, paragraph 65.

APPENDIX F

OUTLINE FOR *THE THIRD REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE*

Executive Summary

Chapter 1. Introduction

This chapter will provide the context for the Third Report. It will present a critical review of relevant developments of global, regional, and national importance that impact on the management of plant genetic resources for food and agriculture (PGRFA). These may include population trends and demography as they relate to food and nutritional security and climate change and other drivers that impact on the conservation and sustainable use of PGRFA. Other topical issues may include reviews on the prevailing needs and perspectives of stakeholders and the defining trends of their interventions along the PGRFA management continuum. As in previous editions, the emerging challenges and opportunities that may encompass advances in science and technology, intellectual property rights regimes, public-private partnerships, the roles of civil society, etc. that may have evolved since the Second Report will be treated. The introduction will also include a summary of the most relevant policies and a section on genetic erosion and vulnerability of PGRFA.

Chapter 2. Conservation of PGRFA

[Relevant CGRFA Target: *By 2020, the genetic diversity of cultivated plants and their wild relatives, as well as of wild food plant species is maintained* in situ, *on-farm, and* ex situ *in a complementary manner.*]

A. In situ conservation

Crop wild relatives and wild harvested plant species are increasingly recognized as invaluable repositories of genes for introducing desirable traits into crops as means for enhancing food and nutritional security. The global attention accorded the imperative of conserving this irreplaceable trove of heritable traits that could be gainfully deployed in crop improvement, in manners that permit easy access to them, is expected to increase considerably. Landraces and underutilized local and traditional crops are at increasing risk of being lost and on-farm conservation and management are recognized as means to stem the genetic erosion that threaten these resources. Taken in concert, information from country assessments of the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture, country reports and the envisaged thematic studies should provide a valid overview on the status of conservation, use and erosion of PGRFA on farms and in wild and managed ecosystems, including genetic reserves.

B. Ex situ conservation

Ex situ collections will likely continue to be the centerpiece of PGRFA conservation and use. Information on the status of germplasm collection, conservation and characterization to be gleaned from national assessments and reports, and updates on international initiatives will together provide an authoritative inference on the statuses of conservation, distribution and exchange, evaluation and utilization, and research for PGRFA held in genebanks. This will enable a treatise on the trends (including opportunities and challenges) that impact *ex situ* conservation. For instance, the means and extent of gaps in gene bank germplasm holdings, targeted collecting and germplasm exchange levels, the security of collections, regeneration, data and information management, and the full range of *ex situ* strategies (storage of orthodox and recalcitrant seed, various culture conditions, and field gene banks, gardens, and arboreta) shall be showcased.

The above information and results will be analyzed in the context of what has changed or emerged since the Second Report, with an emphasis on the gaps and needs going forward.

Chapter 3. Sustainable Use of PGRFA
[Relevant CGRFA Target: *By 2020, there has been an increased use of plant genetic resources for food and agriculture to improve sustainable crop production intensification and livelihoods while reducing genetic vulnerability of crops and cropping systems*.]
In both the First and Second Reports, a chasm can be discerned between the potential for PGRFA – to contribute well adapted crop varieties to sustainable agricultural and economic development, enhance food and nutritional security, allay poverty, and promote health and dietary diversity – and the actual extent to which the resources have been harnessed to do so. This disconnect will still be evident in the Third Report, but it will be a goal of this chapter to document the extent to which the situation has improved in the intervening period since 2009.

Questions to be addressed will include:

i. Will there have been progress in the extent of use of PGRFA in crop improvement, including base-broadening activities through pre-breeding?
ii. Do characterization and evaluation of germplasm result in enhanced use of the germplasm in breeding programs?
iii. What is the relationship between access to germplasm and national crop and variety diversity?

Country-level information on plant breeding capacity, analysis of seed systems (formal and informal), and promotion of crop diversification and neglected and underutilized species will give an important snapshot of the extent of gains achieved in use and deployment of PGRFA and of the level of PGRFA vulnerability. An important aspect of crop production systems for assessing the utility of PGRFA is in the extent of their contributions to the mitigation of disaster situations via the resilience of crop varieties and seed systems. The chapter will conclude by teasing out identified gaps and needs.

Chapter 4. Institutional and Human Capacities for PGRFA Conservation and Sustainable Use
[Relevant CGRFA Target: *By 2020, people are aware of the values of plant genetic resources for food and agriculture and institutional and human capacities are strengthened to conserve and use them sustainably while minimizing genetic erosion and safeguarding their genetic diversity.*]

The management of PGRFA entails more than the germplasm and those who directly work with it. The roles of national policies, legislations, regulations, economics, infrastructure, education, etc. on the management of PGRFA will constitute the overarching subject for this chapter. The country responses to assessment indicators and the country reports will be mined for PGRFA management indices like the status of National PGRFA Programmes, networks, and information systems. This chapter will also take into account current information available from, and ongoing work under, the International Treaty on PGRFA. Considering that up to 15 years that would have passed since the coming into force of the International Treaty on PGRFA, this chapter will also highlight the critical role it has played so far, outlining some key developments and reviewing some of the major progresses made in its implementation, and would be seeking to answer such questions as:

i. Has access to germplasm become easier and exchange improved?
ii. How effective has use of the standard material transfer agreements been in facilitating access and exchange, and how extensive have the multilateral exchange opportunities been?
iii. What is the nature of benefits so far derived by key stakeholders, and have benefits (both perceived and actual) increased over time?
iv. What is the status of national human resources capacity related to PGRFA?
v. How well integrated into national agricultural and economic priorities are matters relating to the management of PGRFA?
vi. Have legal and policy frameworks been instituted for facilitating PGRFA access and benefit sharing?

The extent of the promotion of the conservation and use of PGRFA and the creation of awareness will also be reflected in this chapter. Finally, the conclusions will track the prevailing trends since the

publication of the Second Report with the aim to identify progress made and the gaps and needs to be addressed.

Annexes
Annex 1. List of countries that provided information for the preparation of the Third Report
Annex 2. Regional distribution of countries

Appendices
Appendix 1. Status by country of national legislation related to PGRFA
Appendix 2. Major germplasm collections by crop and institute or organization
Appendix 3. State of diversity for major and minor crops

APPENDIX G

STATUTES OF THE *AD HOC* INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Article 1 - Terms of Reference

1. The *Ad Hoc* Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture (the Working Group) shall:

- review the situation and issues related to aquatic genetic resources for food and agriculture and advise and make recommendations to the Commission on these matters;
- consider the progress made in implementing the Commission's programme of work on aquatic genetic resources for food and agriculture as well as any other matters referred to the Working Group by the Commission; and
- report to the Commission on its activities.

2. In order for the Working Group to carry out this mandate, the Commission will assign specific tasks to the Working Group.

Article II - Composition

The Working Group shall be composed of twenty-eight Member Nations from the following regions:

- 5 from Africa
- 5 from Europe
- 5 from Asia
- 5 from Latin America and the Caribbean
- 4 from Near East
- 2 from Northern America
- 2 from South West Pacific.

Article III - Election and term of office of Members and Alternate Members

1. The Members of the Working Group shall be elected at each regular session of the Commission and serve until the next regular session of the Commission. They shall be eligible for re-election. In addition, the Commission shall elect at each regular session a list of up to two Alternate Members for each region. Alternate Members will replace, in the order in which they appear on the list, any Member who has resigned and informed the Secretariat accordingly.

2. The elected Members and Alternate Members will be eligible for re-election.

3. Members are requested to confirm their participation to the Working Group meeting. If a Member of the Working Group is not able to attend the meeting, and informs the Secretariat accordingly, the Member shall be replaced in a timely manner by one of the elected Alternates from the same region.

4. In case a Member of the Working Group does not attend the meeting, the Working Group, in consultation with the region, may replace this Member, on an *ad hoc* basis, by a Member of the Commission from the same region that is present at the meeting.

Article IV - Officers

1. The Working Group shall elect its Chairperson and one or more Vice-Chairpersons from among the representatives of Members of the Working Group at the beginning of each session. These officers shall remain in office until the next session of the Working Group and be eligible for re-election.

2. The Chairperson, or a Vice-Chairperson in the absence of a Chairperson, shall preside over the meetings of the Working Group and exercise such other functions as may be required to facilitate its work.

Article V - Sessions

The Commission shall decide on the timing and duration of the sessions of the Working Group, when required. In any case, the Working Group shall hold no more than one regular session annually.

Article VI - Observers

1. Members of the Commission which are not Members of the Working Group may participate, upon request to the Commission Secretariat, in the work of the Working Group in an observer capacity.

2. The Working Group, or the bureau on behalf of the Working Group, may invite experts, as well as representatives of specialized international organizations, to attend its meetings.

Article VII - Application of the Rules of Procedure of the Commission on Genetic Resources for Food and Agriculture

The provisions of the Rules of Procedure of the Commission on Genetic Resources for Food and Agriculture shall apply *mutatis mutandis* to all matters not specifically dealt with under the present Statutes.

APPENDIX H

TERMS OF REFERENCE FOR NATIONAL FOCAL POINTS TO THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Recognizing that Commission Members identify their National Focal Points to the Commission on Genetic Resources for Food and Agriculture (National Focal Points) and determine their specific responsibilities, the primary function of National Focal Points is to act as liaisons with the Secretary of the Commission on behalf of their Members and in so doing, they are responsible for:

(i) Coordinating with and strengthening the collaboration of national focal points designated for specific tasks of the Commission;

(ii) Ensuring that relevant institutions in their country are timely informed of dates and agendas of upcoming Commission meetings;

(iii) Supporting, as appropriate, identification of experts and stakeholders to participate in meetings, consultations and assessment processes initiated by the Commission;

(iv) Receiving information related to the Commission and disseminating it to the relevant institutional actors such as ministry offices, experts, stakeholders, indigenous people and local communities and others, as appropriate;

(v) Responding to requests for input from the Commission and its Secretary including through, as appropriate, coordinating a joint reply with relevant experts or institutions;

(vi) Initiate and coordinate, as appropriate, a consultation between relevant national stakeholders on preparatory documents for the regular sessions of the Commission;

(vii) Provide support to Bureau Members to ensure a two-way flow of information between the national and the regional level on matters related to the Commission;

(viii) Collaborating with National Focal Points in other countries to facilitate the work of the Commission and the implementation of instruments developed by the Commission;

(ix) Collaborating and coordinating work with the primary and other national focal points of the Convention on Biological Diversity[1], the national focal points of the International Treaty on Plant Genetic Resources for Food and Agriculture[2] and other relevant national focal points; and

(x) Support raising awareness at national level for the Commission's strategic goals and objectives.

[1] https://www.cbd.int/information/nfp.shtml
[2] http://www.planttreaty.org/nfp

APPENDIX I

MEMBERS AND ALTERNATES OF THE INTERGOVERNMENTAL TECHNICAL WORKING GROUPS, ELECTED AT THE FIFTEENTH REGULAR SESSION OF THE COMMISSION

MEMBERS AND ALTERNATES OF THE INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Composition (no. of countries per region)	***Country***
Africa	Algeria
(5)	Chad
	Kenya
	Mali
	Namibia
	First Alternate: Burkina Faso
	Second Alternate: Zimbabwe
Asia	Bhutan
(5)	Lao People's Democratic Republic
	Mongolia
	Pakistan
	Republic of Korea
	First Alternate: Thailand
	Second Alternate: China
Europe	France
(5)	Netherlands
	Poland
	Slovenia
	Switzerland
	First Alternate: Sweden
	Second Alternate: Russian Federation
Latin America and the Caribbean	Argentina
(5)	Brazil
	Chile
	Jamaica
	Uruguay
	First Alternate: Cuba
	Second Alternate: Costa Rica
Near East	Iran (Islamic Republic of)
(4)	Saudi Arabia
	Sudan
	Yemen
	First Alternate: Egypt
	Second Alternate: Jordan
North America	Canada
(2)	United States of America
Southwest Pacific	Cook Islands
(2)	Fiji
	First Alternate: Vanuatu
	Second Alternate: Samoa

MEMBERS AND ALTERNATES OF THE *AD HOC* INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Composition ***(no. of countries per region)***	***Country***
Africa	Cameroon
(5)	Cape Verde
	Morocco
	Uganda
	South Africa
	First Alternate: Senegal
	Second Alternate: Namibia
Asia	Bangladesh
(5)	Cambodia
	Japan
	Lao People's Democratic Republic
	Malaysia
	First Alternate: Pakistan
	Second Alternate: Sri Lanka
Europe	Czech Republic
(5)	France
	Germany
	Norway
	Spain
	First Alternate: Poland
	Second Alternate: Hungary
Latin America and the Caribbean	Argentina
(5)	Brazil
	Guyana
	Panama
	Uruguay
	First Alternate: Jamaica
Near East	Egypt
(4)	Iran
	Kuwait
	Oman
	First Alternate: Saudi Arabia
	Second Alternate: Qatar
North America	Canada
(2)	United States of America
Southwest Pacific	Palau
(2)	Solomon Islands
	First Alternate: Tonga
	Second Alternate: Marshall Islands

MEMBERS AND ALTERNATES OF THE INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON FOREST GENETIC RESOURCES

Composition (no. of countries per region)	***Country***
Africa	Algeria
(5)	Burkina Faso
	Cameroon
	Ethiopia
	Zimbabwe
	First Alternate: Morocco
	Second Alternate: Burundi
Asia	Bangladesh
(5)	Lao People's Democratic Republic
	Malaysia
	Pakistan
	Republic of Korea
	First Alternate: China
	Second Alternate: Indonesia
Europe	Finland
(5)	Norway
	Poland
	Russian Federation
	United Kingdom
	First Alternate: France
	Second Alternate: Sweden
Latin America and the Caribbean	Argentina
(5)	Brazil
	Chile
	Cuba
	Uruguay
	First Alternate: Panama
	Second Alternate: Guyana
Near East	Afghanistan
(4)	Iraq
	Lebanon
	Sudan
	First Alternate: Iran (Islamic Republic of)
	Second Alternate: Yemen
North America	Canada
(2)	United States of America
Southwest Pacific	Papua New Guinea
(2)	Vanuatu
	First Alternate: Fiji
	Second Alternate: Solomon Islands

MEMBERS AND ALTERNATES OF THE INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Composition ***(no. of countries per region)***	***Country***
Africa	Chad
(5)	Eritrea
	Morocco
	Mozambique
	Senegal
	First Alternate: Malawi
	Second Alternate: Ethiopia
Asia	Bhutan
(5)	Cambodia
	Japan
	Mongolia
	Philippines
	First Alternate: Malaysia
	Second Alternate: India
Europe	Czech Republic
(5)	Germany
	Hungary
	Netherlands
	Spain
	First Alternate: France
	Second Alternate: Switzerland
Latin America and the Caribbean	Argentina
(5)	Brazil
	Chile
	Guyana
	Jamaica
	First Alternate: Costa Rica
	Second Alternate: Paraguay
Near East	Egypt
(4)	Kuwait
	Lebanon
	Yemen
	First Alternate: Sudan
	Second Alternate: Oman
North America	Canada
(2)	United States of America
Southwest Pacific	Cook Islands
(2)	Fiji
	First Alternate: Samoa
	Second Alternate: Tonga

APPENDIX J
LIST OF DOCUMENTS

Working Documents

CGRFA-15/15/1	Provisional agenda
CGRFA-15/15/2	Provisional annotated agenda and time-table
CGRFA-15/15/3	Status of preparation of *The State of the World's Biodiversity for Food and Agriculture*
CGRFA-15/15/4	Targets and indicators for biodiversity for food and agriculture
CGRFA-15/15/4.1	Targets and indicators for plant genetic resources for food and agriculture
CGRFA-15/15/4.2	Targets and indicators for forest genetic resources
CGRFA-15/15/5	*Draft Elements to Facilitate Domestic Implementation of Access and Benefit-Sharing for Different Subsectors of Genetic Resources for Food and Agriculture*
CGRFA-15/15/6	Biodiversity and nutrition
CGRFA-15/15/7	Application and integration of biotechnologies for the conservation and sustainable utilization of genetic resources for food and agriculture
CGRFA-15/15/8	Genetic resources for food and agriculture and climate change
CGRFA-15/15/9	Report of the Eighth Session of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture
CGRFA-15/15/10	Preparation of *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*
CGRFA-15/15/11	Implementation and updating of the Global Plan of Action for Animal Genetic Resources
CGRFA-15/15/12	Report of the Third Session of the Intergovernmental Technical Working Group on Forest Genetic Resources
CGRFA-15/15/13	Draft Strategy for the Implementation of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources
CGRFA-15/15/14	Report of the Seventh Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture
CGRFA-15/15/15	Implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture
CGRFA-15/15/16	Preparation of *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*
CGRFA-15/15/17	Status of preparation of *The State of the World's Aquatic Genetic Resources for Food and Agriculture*
CGRFA-15/15/18	Establishment of an *Ad Hoc* Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture
CGRFA-15/15/19	Review of work on micro-organisms and invertebrates
CGRFA-15/15/20.1	*Implementation of the Multi-Year Programme of Work*

CGRFA-15/15/20.2	National Focal Points to the Commission on Genetic Resources for Food and Agriculture
CGRFA-15/15/21	Cooperation with international instruments and organizations
CGRFA-15/15/22	Recent developments with regard to observers attending meetings of FAO
CGRFA-15/15/23	The composition of the Commission's Intergovernmental Technical Sectoral Working Groups and the participation of observers / alternates

Information Documents

CGRFA-15/15/Inf.1	Information note for participants
CGRFA-15/15/Inf.2	Statutes of the Commission on Genetic Resources for Food and Agriculture
CGRFA-15/15/Inf.3	Rules of Procedure of the Commission on Genetic Resources for Food and Agriculture
CGRFA-15/15/Inf.4	Statutes of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture, and Members elected by the Fourteenth Regular Session of the Commission
CGRFA-14/15/Inf.5	Statutes of the Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture, and Members elected by the Fourteenth Regular Session of the Commission
CGRFA-14/15/Inf.6	Statutes of the Intergovernmental Technical Working Group on Forest Genetic Resources, and Members elected by the Fourteenth Regular Session of the Commission
CGRFA-15/15/Inf.7 Rev.1	Statement of competence and voting rights submitted by the European Union (EU) and its Member States
CGRFA-15/15/Inf.8	Submissions by international instruments and organizations on the prioritized themes of the Session
CGRFA-15/15/Inf.9	Reporting Format for Monitoring the Implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture
CGRFA-15/15/Inf.10	Explanatory notes to the distinctive features of genetic resources for food and agriculture
CGRFA-15/15/Inf.11	Report of the First Session of the Team of Technical and Legal Experts on Access and Benefit-sharing
CGRFA-15/15/Inf.12	Report of the Second Session of the Team of Technical and Legal Experts on Access and Benefit-sharing
CGRFA-15/15/Inf.13	Submissions of stakeholders on voluntary codes of conduct, guidelines and best practices and/or standards in relation to access and benefit-sharing for all subsectors of genetic resources for food and agriculture
CGRFA-15/15/Inf.13 Add.1	Submission by the European Regional Focal Point for Animal Genetic Resources (ERFP) on voluntary codes of conduct, guidelines and best practices and/or standards in relation to access and benefit-sharing for animal genetic resources for food and agriculture
CGRFA-15/15/Inf.14	Government submissions on conditions under which specific genetic resources for food and agriculture are exchanged and utilized

CGRFA-15/15/Inf.15	Draft Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning (Revised Version)
CGRFA-15/15/Inf.16	Lessons learned about ways and means to conserve and use genetic diversity to build resilience to climate change in food and agriculture systems - survey report
CGRFA-15/15/Inf.17.1	Draft *Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture* (Part 1 & 2)
CGRFA-15/15/Inf.17.2	Draft *Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture* (Part 3)
CGRFA-15/15/Inf.17.3	Draft *Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture* (Part 5)
CGRFA-15/15/Inf.18	Status and trends of animal genetic resources - 2014
CGRFA-15/15/Inf.19	Synthesis progress report on the implementation of the Global Plan of Action for Animal Genetic Resources - 2014
CGRFA-15/15/Inf.20	Draft Guidelines for the Development of Integrated Multipurpose Animal Recording Systems
CGRFA-15/15/Inf.21	Draft Guidelines for Developing a National Strategy for Plant Genetic Resources for Food and Agriculture: Translating the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture into National Action
CGRFA-15/15/Inf.22	Global networking on *in situ* Conservation and on-farm management of plant genetic resources for food and agriculture
CGRFA-15/15/Inf.23	National level conservation and use of landraces
CGRFA-15/15/Inf.24	National level conservation of crop wild relatives
CGRFA-15/15/Inf.25	Revised Draft Guide for National Seed Policy Formulation
CGRFA-15/15/Inf.26	Report from the Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture
CGRFA-15/15/Inf.27	Questionnaire for the preparation of country reports for *The State of the World's Aquatic Genetic Resources for Food and Agriculture*
CGRFA-15/15/Inf.28	Progress on the International Initiative for the Conservation and Sustainable Use of Pollinators
CGRFA-15/15/Inf.29	Implementation Plan for the Commission's Multi-Year Programme of Work (2014-2023), Annex to the Strategic Plan 2014-2023
CGRFA-15/15/Inf.30	Report from the Secretariat of the Convention on Biological Diversity
CGRFA-15/15/Inf.31	Report from the Global Crop Diversity Trust
CGRFA-15/15/Inf.32	Report from the CGIAR Consortium
CGRFA-15/15/Inf.33	Déclaration conjointe d'intention de cooperation sur les ressources génétiques pour l'alimentation et l'agriculture entre le Secrétariat de la Commission sur les ressources génétiques pour l'alimentation et l'agriculture et le Centre de cooperation internationale en recherche agronomique pour le développement (Cirad)
CGRFA-15/15/Inf.34	Joint Statement of Intent for Cooperation between the Secretariat of the Global Forum on Agricultural Research and the Secretariat of the Commission on Genetic Resources for Food and Agriculture

CGRFA-15/15/Inf.35	List of Documents
CGRFA-15/15/Inf.36	List of delegates and observers

Background Study Papers

Background Study Paper No. 66	Ecosystem services provided by livestock species and breeds, with special consideration to the contributions of small-scale livestock keepers and pastoralists
Background Study Paper No. 67	Higher-order composite indices for plant genetic resources for food and agriculture targets

Other documents

Genebank Standards for Plant Genetic Resources for Food and Agriculture

Guidelines for the Preparation of the Country Reports for *The State of the World's Biodiversity for Food and Agriculture*

Guidelines on *In Vivo* Conservation of Animal Genetic Resources

The State of the World's Forest Genetic Resources

Synthetic Account of The State of the World's Forest Genetic Resources

APPENDIX K

MEMBERS OF THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

AFRICA
Algeria
Angola
Benin
Botswana
Burkina Faso
Burundi
Cameroon
Cape Verde
Central African Republic
Chad
Comoros
Congo, Republic of the
Côte d'Ivoire
Democratic Republic of the Congo
Equatorial Guinea
Eritrea
Ethiopia
Gabon
Gambia
Ghana
Guinea
Guinea-Bissau
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Namibia
Niger
Nigeria
Rwanda
Sao Tome and Principe
Senegal
Seychelles
Sierra Leone
South Africa
Swaziland
Togo
Tunisia
Uganda
United Republic of Tanzania
Zambia
Zimbabwe

ASIA
Bangladesh
Bhutan
Cambodia
China
Democratic People's Republic of Korea
India
Indonesia
Japan
Kazakhstan
Kyrgyzstan
Lao People's Democratic Republic
Malaysia
Maldives
Mongolia
Myanmar
Nepal
Pakistan
Philippines
Republic of Korea
Sri Lanka
Thailand
Vietnam

NEAR EAST
Afghanistan
Azerbaijan
Egypt
Iran, Islamic Republic of
Iraq
Jordan
Kuwait
Lebanon
Libyan Arab Jamahiriya
Oman
Qatar
Saudi Arabia
Sudan
Syrian Arab Republic
Tajikistan
United Arab Emirates
Yemen

EUROPE
Albania
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
European Union
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Latvia
Lithuania
Luxembourg
Malta
Moldova, Republic of
Montenegro
Netherlands
Norway
Poland
Portugal
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
The former Yugoslav Republic of Macedonia
Turkey
Ukraine
United Kingdom

LATIN AMERICA AND THE CARIBBEAN
Antigua and Barbuda
Argentina
Bahamas
Barbados
Belize
Bolivia
Brazil
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
El Salvador
Grenada
Guatemala
Guyana
Haiti
Honduras
Jamaica
Mexico
Nicaragua
Panama
Paraguay
Peru
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Suriname
Trinidad and Tobago
Uruguay
Venezuela

NORTH AMERICA
Canada
United States of America

SOUTH WEST PACIFIC
Australia
Cook Islands
Fiji
Marshall Islands
New Zealand
Palau
Papua New Guinea
Samoa
Solomon Islands
Tonga
Vanuatu

As of January 2015, a total of 178 countries and the European Union are Members of the Commission.