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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 8 of the Provisional Agenda

INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON FOREST GENETIC RESOURCES

Sixth Session

13 - 15 April 2021

CLIMATE CHANGE AND GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Seventeenth Regular Session, requested FAO to prepare a scoping study on the role of genetic resources for food and agriculture (GRFA) in adaptation to and mitigation of climate change, including knowledge gaps, taking into account the special reports on terrestrial and marine systems by the Intergovernmental Panel on Climate Change (IPCC) and other available relevant sources, including examples from different regions and subsectors.[1]

2. The Commission requested its Intergovernmental Technical Working Groups (Working Groups) to review the study and, if a global assessment of the role of GRFA is considered pertinent, to provide guidance to the Commission on its preparation.[2] In addition, the Commission requested the Secretariat to prepare a draft work plan for review by its Working Groups at their next sessions.[3]

3. The present document provides an overview of the Commission's past work on climate change, presents key findings of the scoping study, describes how climate change is currently reflected in the Commission's work on GRFA, and proposes activities the Commission may wish to consider as part of its future work on climate change. Details of work relevant to the Commission's work under the FAO Climate Change Strategy are presented in the document *FAO activities on climate change* (**CGRFA/WG-FGR-6/21/Inf.5**).

II. BACKGROUND

4. At its Twelfth Regular Session in 2009, the Commission recognized the need to address climate change in its Multi-Year Programme of Work (MYPOW).[4] This led to the preparation of a series of sectoral studies, published in 2011.[5] An overview publication based on the sectoral studies was published in 2015.[6]

5. In 2011, the Commission agreed on the need for a work programme on climate change and GRFA, and requested its Secretary to develop such a programme based on four main elements: strategies and policies; tools and technologies for genetic resources and climate change; forging partnerships; and monitoring progress.[7] In 2013, the Commission adopted the Programme of Work on Climate Change and Genetic Resources for Food and Agriculture.[8] In 2015, the Commission endorsed the *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning* (Voluntary Guidelines).[9] During the same year, the FAO Conference approved the Voluntary Guidelines and invited countries to implement them.[10] The Commission also approved a proposed revision to its Programme of Work on Climate Change and Genetic Resources for the period of 2015 to 2016.[11]

6. In 2017, the Commission welcomed the progress made in the implementation of the Programme of Work on Climate Change and Genetic Resources for Food and Agriculture and decided to integrate the work on climate change into its Multi-Year Programme of Work.[12] It also requested

[1] CGRFA-17/19/Report, paragraph 29.
[2] Ibid.
[3] CGRFA-17/19/Report, paragraph 30.
[4] CGRFA-12/09/Report, paragraph 78.
[5] See Background Study Papers No. 48, 53, 54, 55, 56, 57, 60.
[6] FAO. 2015 *Coping with climate change – the roles of genetic resources for food and agriculture for food and agriculture*. Rome.
[7] CGRFA-13/11/Report, paragraph 52.
[8] CGRFA-14/13/Report, paragraph 36.
[9] CGRFA-15/15/Report, paragraph 34.
[10] C 2015/REP, paragraph 52.
[11] CGRFA-15/15/Report, paragraph 35.
[12] CGRFA-16/17/Report Rev.1, paragraph 27.

FAO to ensure the full integration of the Commission's work on climate change and GRFA into the Organization's Strategic Framework and its Climate Change Strategy.[13]

7. As noted above, in 2019, the Commission requested the preparation of a scoping study on GRFA and climate change and requested the Secretariat to prepare a draft work plan for review by the Working Groups at their next sessions.[14] The Evaluation of FAO's support to climate action (SDG13) and the implementation of FAO's Strategy on Climate Change (2017) have been finalized.[15]

III. THE ROLE OF GENETIC RESOURCES FOR FOOD AND AGRICULTURE IN CLIMATE CHANGE ADAPTATION AND MITIGATION

8. In response to the Commission's request,[16] FAO prepared the scoping study contained in the document *The role of genetic resources for food and agriculture in climate change adaptation and mitigation* **(CGRFA/WG-FGR-6/21/Inf.6)**. The scoping study, prepared in collaboration with partners, draws on the above-mentioned 2015 overview publication and a review of literature published since. It takes into account the Special Reports prepared by the IPCC on *Global warming of 1.5°C*,[17] *Climate change and land*[18] and *The ocean and cryosphere in a changing climate*.[19] Key stakeholders from the crop and livestock breeding industries, as well as researchers from universities and the Consultative Group for International Agricultural Research (CGIAR), provided inputs.

9. The scoping study focuses mainly on the state of current uses of GRFA in adapting the agricultural sectors to climate change. It also explores the impacts of climate change on GRFA and considers the significance of GRFA in climate change adaptation and mitigation.

10. The impacts of climate change on GRFA have been and continue to be studied, and there is scientific consensus that these impacts are overwhelmingly negative. GRFA have the potential to significantly contribute to the adaptation of crop and livestock production, forestry, fisheries and aquaculture to climate change, and also have potential to contribute to climate change mitigation. While there are many examples around the world that illustrate this potential, GRFA are not usually considered a crucial part of climate change adaptation and mitigation strategies; they are often taken for granted. The scoping study points out that the specifics of climate change adaptation and mitigation differ by sector, although they are highly interlinked, and concludes that policy recommendations therefore need to be presented through a sector-specific lens while acknowledging that many climate change issues are cross-sectoral. However, while a number of countries have policies in place that allow for the integration of sustainable use of GRFA into climate change

[13] CGRFA-16/17/Report Rev.1, paragraph 27.
[14] CGRFA-17/19/Report, paragraph 30.
[15] PC 130/12; PC 130/12 Supp.1
[16] CGRFA-17/19/Report, paragraph 29.
[17] IPCC. 2018. Summary for Policymakers. *In* V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor & T. Waterfield, eds. *Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. World Meteorological Organization, Geneva, Switzerland. (available at https://www.ipcc.ch/sr15/chapter/spm/).
[18] IPCC. 2019. Summary for Policymakers. *In* P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D.C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi & J. Malley, eds. *Climate change and land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. Geneva, Switzerland. (available at https://www.ipcc.ch/srccl/chapter/summary-for-policymakers/).
[19] IPCC. 2019. *IPCC Special report on the ocean and cryosphere in a changing climate.* H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama & N.M. Weyer, eds. Geneva, Switzerland. (available at https://www.ipcc.ch/srocc/).

adaptation and mitigation strategies, there is generally little information available on the implementation of such policies or on their impact.

11. The scoping study further concludes that the contributions of the characterization, conservation, breeding and sustainable use of GRFA to climate change adaptation and mitigation should continue to be strengthened in all sectors, as the potential to use GRFA in climate change adaptation and mitigation remains largely untapped. From a policy point of view, it concludes that integrating climate change-related actions into the Commission's global plans of action and relevant national policies and strategies is an effective way of achieving this objective.

12. In addition, the scoping study concludes that while there is an increasing amount of scientific knowledge available on the impacts of climate change on GRFA and the general adaptability of breeds and species, few data are available on the state of implementation of genetic improvement efforts targeting climate-resilience, and very few are available on the state of adoption of newly bred climate-resilient genetic material. Furthermore, some existing GRFA information systems lack comprehensive data on traits relevant to climate change adaptability or mitigation potential, and − where trait information exists − deploying appropriate germplasm at a given site may be a problem. Data, breeding and GRFA dissemination systems are all important for the development of adaptation and mitigation strategies that take into account the potentials of GRFA.

IV. CLIMATE CHANGE IN THE COMMISSION'S WORK

13. While climate change is one of the cross-sectoral work streams of the Commission's MYPOW, it is also reflected in its sectoral global assessments and policy instruments.

Climate change and the Commission's global assessments

14. Climate change and, in particular, the effects of climate change on GRFA and GRFA management, are addressed in all *The State of the World* (SoW) reports. To a lesser extent, the reports also address adaptation to climate change and, in the case of animal genetic resources (AnGR) and forest genetic resources (FGR), mitigation of climate change.

15. *The State of the World's Aquatic Genetic Resources for Food and Agriculture* (SoW-AqGR)[20] and *The State of the World's Biodiversity for Food and Agriculture* (SoW-BFA),[21] both published in 2019, identify climate change among the main drivers directly and indirectly affecting aquatic genetic resources (AqGR) and BFA. The SoW-BFA discusses many aspects of the links between biodiversity and climate change, including policy and legal frameworks in this field and the role of BFA in the supply of climate-regulating ecosystem services. The SoW-AqGR identifies needs and gaps in the conservation, sustainable use and development of AqGR that need to be addressed in relation to climate change.

16. Climate change will also feature in future reports, such as *The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture* (SoW-PGRFA-3), which is currently under preparation. The relevant document, *Preparation of country reports for the Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*,[22] mentions the increased attention being given to climate change since 2012 and invites countries to answer the following questions: "How have farmers' responses to climate change affected on-farm management and improvement of PGRFA [(plant genetic resources for food and agriculture)]? What trends have been observed?" In addition, countries will have the opportunity to report on the role of PGRFA in climate change adaptation and mitigation in their summative narrative reports. *The Guidelines for the preparation of country reports for The Second Report on the State of the World's Forest Genetic*

[20] http://www.fao.org/3/ca5256en/CA5256EN.pdf
[21] http://www.fao.org/3/ca3129en/CA3129EN.pdf
[22] CGRFA-17/19/9.4/Inf.1.

Resources contain Verifier B.4.1.3: "Number of countries that have integrated FGR conservation and use into their national adaptation strategies for climate change"[23].

Climate change and the Commission's policy instruments

17. Climate change plays an increasingly important role in the policy instruments prepared by the Commission in response to the global assessments. The Global Plan of Action for Animal Genetic Resources (GPA-AnGR) refers, for example, to climate change in the "long-term goal" under Strategic Priority Area 2 (Sustainable Use and Development) and in the introduction to Strategic Priority Area 3 (Conservation).[24] However, the implementation of climate change-related activities is currently not included in the ongoing monitoring of the implementation of the GPA-AnGR.[25]

18. In reviewing the GPA-AnGR, the Commission, at its Sixteenth Regular Session,[26] and the FAO Conference, in Resolution 3/2017,[27] invited Members to integrate animal genetic diversity into national climate change adaptation planning, addressing its potential in both adaptation to and mitigation of climate change, and requested FAO to review progress in the implementation of the GPA-AnGR and its relevance and orientation in light of new and emerging challenges and opportunities in the management of AnGR. Climate change may also play an important role in future calls for proposals under the Funding Strategy for the Implementation of the GPA-AnGR.[28]

19. The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture contains references to climate change in 13 of the 18 Priority Activities on sustainable use, conservation and building sustainable institutional and human capacities.[29] However, neither the *Higher-Order Composite Indices for Plant Genetic Resources for Food and Agriculture Targets*[30] nor the *Draft revised reporting format for monitoring the implementation of the Second Global Plan of Action on Plant Genetic Resources for Food and Agriculture*[31] refer to climate change.

20. The Global Plan of Action for Forest Genetic Resources (GPA-FGR) refers to climate change across all its Strategic Priority Areas. In addition, Strategic Priority 14 – "Support climate change adaptation and mitigation through proper management and use of FGR"[32] – specifically addresses the issue of climate change. It refers to current growing concerns about climate change and its effects on ecosystems and how the performance of forest-related production systems challenges stakeholders in FGR management to better understand forest species and their adaptation mechanisms. The tools adopted by the Commission, for monitoring the implementation of the GPA-FGR[33] also track the integration of FGR conservation and use into national adaptation strategies for climate change. Furthermore, the Funding Strategy for the Implementation of the GPA-FGR[34] encourages countries to mainstream the conservation, use and development of FGR into large and holistic country-led actions that are designed to enhance forest-based adaptation and mitigation measures for climate change.

21. The Commission's future policy instruments may also address climate change in considerable detail. The document *Biodiversity for food and agriculture – revised draft needs and possible actions*,[35] developed in response to the SoW-BFA, refers to climate change in multiple places, including its rationale and objectives and under Strategic Priority Area 2 (Management of biodiversity

[23] CGRFA-17/19/10.3/Inf.1.
[24] http://www.fao.org/3/a-a1404e.pdf
[25] CGRFA/WG-AnGR-5/09/3.1; http://www.fao.org/animal-genetics/global-policy/reporting-system/en/
[26] CGRFA-16/17/Report Rev.1, *Appendix* D.
[27] Resolution 3/2017: Reaffirming the World's commitment to the Global Plan of Action for Animal Genetic Resources.
[28] CGRFA-17/19/11.2/Inf.2.
[29] http://www.fao.org/3/i2624e/i2624e00.pdf
[30] Background Study Paper No.67.
[31] CGRFA-17/19/9.2/Inf.6
[32] http://www.fao.org/3/a-i3849e.pdf
[33] CGRFA-16/17/20
[34] CGRFA-17/19/Report, *Appendix D.*
[35] CGRFA/NFP-BFA-2/21/2. *Appendix I.*

for food and agriculture). Similarly, the draft Global Plan of Action on Aquatic Genetic Resources for Food and Agriculture, which the Commission will consider at its forthcoming Eighteenth Regular Session, provides an opportunity to agree on climate change-related action, including integration of information on traits relevant to climate change adaptation and mitigation in the new information system for AqGR.

V. DRAFT WORK PLAN ON CLIMATE CHANGE

22. Given the Commission's decision, at its Sixteenth Regular Session, to integrate its work on climate change into its MYPOW, future work on climate change should be reflected in the MYPOW as a work stream. A draft revised version of the MYPOW work stream on climate change is contained in *Appendix I*.

23. Interactions between BFA, including GRFA, and climate change occur at the genetic, species and production-system level. Based on the results of the scoping study, it is evident that there continue to be many knowledge gaps about interactions at all levels. The study shows that, in particular, further research is needed to fill data and information gaps regarding the genetic level and regarding climate change-related breeding programmes in the public and the private sectors.

24. Though some countries have policies in place to integrate the sustainable use of GRFA into climate change actions, information on the implementation of such policies and on their impact is scarce. A country-driven reporting process could possibly provide a better global overview of national policies and their implementation, and would also be an opportunity for countries to review their GRFA-related climate policies and programmes at national level.

25. The Commission's work plan on GRFA and climate change could consist of five complementary elements.

Developing a common approach for addressing climate change in the Commission's global assessments and policy instruments

26. The Commission's global assessments and policy instruments already make reference to climate change, even though to varying degrees. The Commission may therefore wish to define a common approach for all sectors, including BFA, on how future assessments and policy instruments should address climate change.

Country and stakeholder surveys on climate change and GRFA

27. A draft model national survey to be filled by National Focal Points is attached to this document (*Appendix II*). It includes policy implementation questions and gathers information on country-level activities related to the role of GRFA in climate change adaptation and mitigation, including actions on the implementation of the Voluntary Guidelines. Additional stakeholder surveys could focus on obtaining more details of the implementation of relevant climate change approaches and practices. The survey results could help to complement the information gathered so far through the monitoring frameworks for the implementation of global plans of action, and serve as a baseline for future SOW reports until climate is consistently addressed in all Commission assessments.

Publication of the scoping study

28. After its review by the Working Groups and the Commission, it is foreseen that the draft scoping study will be published as an FAO document. Sector-specific topics from the study could serve as a basis for the forthcoming SOW reports or their supporting thematic studies.

Reviewing the Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning

29. The Voluntary Guidelines,[36] adopted by the Commission in 2015, focus on adaptation. However, since 2015, the Koronivia Joint Work on Agriculture and the FAO Climate Change Strategy[37] have been adopted, and both stress the role of the agriculture sectors in climate change mitigation. This may warrant a revision of the Voluntary Guidelines so as to include mitigation.

Improving the integration of BFA, including GRFA, in FAO's work on climate change

30. Considering the Evaluation of FAO's support to climate action (SDG 13) and the implementation of FAO's Strategy on Climate Change (2017), the Commission may wish to recommend FAO to integrate BFA and GRFA issues fully into its future climate change work.

VI. GUIDANCE SOUGHT

31. The Working Group may wish to:

i. take note of the scoping study on the role of GRFA in adaptation to, and mitigation of, climate change and recommend that the Commission request FAO to publish it;

ii. review the draft revised MYPOW work stream on climate change, as contained in *Appendix I* to this document, and recommend any changes that may be required to the Commission; and

iii. review the country survey on climate change and GRFA, as contained in *Appendix II* to this document, and request the Secretariat to incorporate its comments into a revised version.

32. The Working Group may further wish to recommend to the Commission that it:

i. review the country survey on climate change and GRFA, and request FAO to circulate the survey to countries and present the results to the next sessions of the Working Groups and the Commission, for their consideration;

ii. request FAO to review the *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning*, and to suggest changes, as appropriate, for consideration by the Working Groups and the Commission;

iii. request FAO to develop a common approach for all sectors of GRFA on how climate change will be addressed in future assessments and policy instruments, for consideration by the Working Groups and the Commission; and

iv. request FAO to fully consider BFA and GRFA in its future work on climate change.

[36] http://www.fao.org/3/i4940e/i4940e.pdf
[37] http://www.fao.org/3/a-i7175e.pdf

APPENDIX I

MULTI-YEAR PROGRAMME OF WORK: MAJOR OUTPUTS AND MILESTONES RELATED TO CLIMATE CHANGE (2021–2029)

	18th Session **2021**	**19th Session** **2023**	**20th Session** **2025**	**21st Session** **2027**	**22nd Session** **2029**
Climate change	Review of work on climate change and GRFA	Results of country survey on GRFA and climate change Review of revised Voluntary Guidelines	Follow up to survey on GRFA and climate change		Review of work on climate change and GRFA

APPENDIX II

DRAFT SURVEY ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE AND CLIMATE CHANGE

Climate change poses new challenges to the management of the world's genetic resources for food and agriculture (GRFA), but it also underlines their importance. The scoping study *The role of genetic resources for food and agriculture in climate change adaptation and mitigation* noted that the specifics of climate change adaptation and mitigation differ by sector. The present survey directed at national governments aims to gather information at country level on activities related to the role of GRFA in climate change adaptation and mitigation.

Country:	
Prepared by (name, function):	
Date:	

Q1: Has your country conducted a stock taking/inventory of the current state of conservation and use of GRFA in the context of climate change adaptation and mitigation, and did this include an analysis of the strengths, weaknesses, opportunities and threats (SWOT)? Please indicate who took the action – government, research, NGO/CSO – and when?

	Yes, stocktaking and SWOT	Yes, stocktaking only	If yes, who and when?	No
Animal genetic resources for food and agriculture				
Aquatic genetic resources for food and agriculture				
Forest genetic resources				
Micro-organism and invertebrate genetic resources for food and agriculture				
Plant genetic resources for food and agriculture				

If the answer to Q1 is yes, please provide further information.

Q2: Has your country ensured that GRFA conservation and use concerns identified during the stock taking/inventory process have been addressed, taking account of national development goals in relevant areas such as food security, nutrition and health, rural development and environmental management?

	Yes	No

Animal genetic resources for food and agriculture		
Aquatic genetic resources for food and agriculture		
Forest genetic resources		
Micro-organism and invertebrate genetic resources for food and agriculture		
Plant genetic resources for food and agriculture		

If the answer to Q2 is yes, please provide further information.

Q3: Has your country assessed the impact of management practices on the sustainable use and conservation of GRFA and on the ecosystem services they deliver, and identified and validated those practices that are found to be most conducive to climate change adaptation and mitigation?

	Yes, comprehensive for the whole sector	Yes, for certain management practices in certain circumstances	Specify practices that are conducive	No
Animal genetic resources for food and agriculture				
Aquatic genetic resources for food and agriculture				
Forest genetic resources				
Micro-organism and invertebrate genetic resources for food and agriculture				
Plant genetic resources for food and agriculture				

If the answer to Q3 is yes, please provide further information.

Q4: Has your country, in the last 5 years, analysed current climate and future climate change scenarios with respect to the expected impact on GRFA, either on a national scale or via localized studies, taking into account the concerns of different genetic resources sectors and socio-economic implications for rural communities? If yes, please indicate who took the action – government, research, NGO/CSO.

	Yes, nation wide	Yes, local	If yes, who?	No
Animal genetic resources for food and agriculture				
Aquatic genetic resources for food and agriculture				

Forest genetic resources				
Micro-organism and invertebrate genetic resources for food and agriculture				
Plant genetic resources for food and agriculture				

If the answer to Q4 is yes, please provide further information.

Q5: Has your country, in the last 5 years, undertaken an assessment of the risk and vulnerability of GRFA use and conservation with regard to climate change? If yes, please indicate who took the action – government, research, NGO/CSO.

	Yes	If yes, who?	No
Animal genetic resources for food and agriculture			
Aquatic genetic resources for food and agriculture			
Forest genetic resources			
Micro-organism and invertebrate genetic resources for food and agriculture			
Plant genetic resources for food and agriculture			

If the answer to Q5 is yes, please provide further information.

Q6: Has your country identified gaps and weaknesses in capacity to undertake the various actions associated with the use and conservation of GRFA in the context of climate change adaptation and mitigation? If yes, which gaps and weaknesses were identified?

	Adaptation: yes/no	Adaptation: if yes, please specify	Mitigation: yes/no	Mitigation: if yes, please specify
Institutional gaps and weaknesses				
Technical gaps and weaknesses				
Other				

Q7: Which of the following areas has your country considered in its national adaptation plan (NAP)?

- ☐ Improving *in situ* and *ex situ* conservation of GRFA
- ☐ Improving characterization and evaluation of GRFA, including of conserved materials
- ☐ Improving methods for identifying and making available appropriate GRFA for particular circumstances

- ☐ Introducing new species, populations, varieties and breeds likely to be more adapted to changed conditions
- ☐ Strengthening production system adaptability and resilience through diversification
- ☐ Improving the quality of supporting and regulating ecosystem services such as pollination, pest and disease regulation and water-quality regulation
- ☐ Developing better methods of breeding new crop, animal, forest and fish varieties, breeds and populations
- ☐ Developing ways of capacity building, extension and information dissemination
- ☐ Increasing awareness of the value of GRFA
- ☐ Other: please specify

Q8: Does your country have a specific national adaptation plan for GRFA? Has it identified actions needed to support the conservation and use of GRFA, taking account of opportunities for coordinated actions across GRFA sectors?

- ☐ Yes, finalized
- ☐ In preparation
- ☐ No

Q8.1: If answer to Q8 is "yes", please provide the title of the document, a description of it and a link.

Q8.2: If the answer to Q8 is "In preparation", at which step of the GRFA adaptation plan process is your country?

- ☐ Deciding on the frame and scope of the adaptation plan
- ☐ Undertaking the required vulnerability and risk assessments
- ☐ Identifying the expected impacts of other changes
- ☐ Identifying expected added impact of climate change
- ☐ Identifying and assessing adaptation options
- ☐ Establishing iterative processes for monitoring and managing GRFA related risks

If the answer to Q8 is no, then

Q9: If your country has not developed a specific national adaptation plan for GRFA, has it included GRFA use and conservation in wider sectoral or cross-sectoral adaptation plans?

	Yes	Specify the sectoral or cross-sectoral plan	No
Animal genetic resources for food and agriculture			
Aquatic genetic resources for food and agriculture			

Forest genetic resources			
Micro-organism and invertebrate genetic resources for food and agriculture			
Plant genetic resources for food and agriculture			

Q10: Which area(s) of management of GRFA does your country consider as important for adaptation to and mitigation of climate change?

	GRFA sector	Adaptation: yes/no	Adaptation: if yes, please specify	Mitigation: yes/no	Mitigation: if yes, please specify
Characterization					
Sustainable use and selection					
Conservation					
Access and benefit-sharing					

Q11: Has your country established the institutional arrangements needed to strengthen the role of GRFA in national adaptation and mitigation planning?

Institutional arrangements for	Adaptation: yes/no	Adaptation: if yes, please specify	Mitigation: yes/no	Mitigation: if yes, please specify
GRFA in general				
Animal genetic resources for food and agriculture				
Aquatic genetic resources for food and agriculture				
Forest genetic resources				
Micro-organism and invertebrate genetic resources for food and agriculture				
Plant genetic resources for food and agriculture				

If the answer to Q11 is yes, please provide further information.

Q12: Has your country prepared policy-relevant materials in order to increase the awareness of policy-makers of the value of GRFA?

- ☐ Yes
- ☐ No

If the answer to Q 12 is yes, please provide further information.

Q13: Has your country identified, and included in some official national policy document, possible synergies, conflicts or trade-offs between the national adaptation/mitigation plan for GRFA and other aspects of national adaptation/mitigation planning?

	No	Yes	If yes, specify the sectoral or cross-sectoral policy/ plan	If yes, what are the synergies or trade-offs in question?
Animal genetic resources for food and agriculture				
Aquatic genetic resources for food and agriculture				
Forest genetic resources				
Micro-organism and invertebrate genetic resources for food and agriculture				
Plant genetic resources for food and agriculture				

Q14: In national planning related to the contributions of GRFA to climate change adaptation and mitigation, or in the preparation of policies or national plans on this subject, have the following been taken into account?

	Adaptation	Mitigation
The different characteristics of genetic resources and their conservation and use (specify the sector)		
The existing global plans of action for animal, forest and plant genetic resources (add new global plans of action when adopted) (please specify)		
The significance of an integrated approach across the different sectors of GRFA		
Other relevant instruments (please specify)		
The different institutions involved in the characterization, conservation and use of GRFA (please specify the sector)		

The collaborative arrangements developed to prepare country reports for *The State of the World* reports on plant, animal, forest and aquatic genetic resources (please specify the sector)		
The various institutional arrangements that link GRFA sectors to national agricultural, environmental, health and planning entities or agencies (please specify)		

Q15: Has your country established a country-level coordination mechanism to oversee and coordinate national adaptation planning for GRFA, via specific GRFA-focused instruments or as part of wider plans?

	Yes, please specify	No
Animal genetic resources for food and agriculture		
Animal genetic resources for food and agriculture included in livestock or agriculture sector plan		
Aquatic genetic resources for food and agriculture		
Aquatic genetic resources for food and agriculture included in aquaculture or fisheries plan		
Forest genetic resources		
Forest genetic resources included in forestry and agroforestry plan		
Micro-organism and invertebrate genetic resources for food and agriculture		
Plant genetic resources for food and agriculture		
Plant genetic resources for food and agriculture included in agriculture and horticulture plan		
Several sectors of GRFA included in an integrated plan covering agriculture sectors		
Several sectors of GRFA included in land use or rural development plans		

Q16: Has your country established a country-level coordination mechanism to oversee and coordinate implementation of national mitigation planning for GRFA, via specific GRFA-focused instruments or as part of wider plans?

	Yes, please specify	No
Animal genetic resources for food and agriculture		

Animal genetic resources for food and agriculture included in livestock or agriculture sector plan		
Aquatic genetic resources for food and agriculture		
Aquatic genetic resources for food and agriculture included in aquaculture or fisheries plan		
Forest genetic resources		
Forest genetic resources included in forestry and agroforestry plan		
Micro-organism and invertebrate genetic resources for food and agriculture		
Plant genetic resources for food and agriculture		
Plant genetic resources for food and agriculture included in agriculture and horticulture plan		
Several sectors of GRFA included in an integrated plan covering agriculture sectors		
Several sectors of GRFA included in land use or rural development plans		

Q17: Has your country, either on a national scale or via localized studies, implemented the following types of projects related to GRFA and climate change adaptation? Please include all projects, including those undertaken by the private sector or NGOs.

	PGR	FGR	AnGR	AqGR	MIGR
Capacity-development programmes for GRFA and climate change stakeholders					
Public-awareness campaigns					
Targeted selection and breeding					
Community-based testing programmes for new materials					
Research activities					
Conservation of GRFA					
Other					
No projects have been implemented					

If the answer to Q 17 is yes, please specify.

Q18: Has your country undertaken monitoring and impact assessment of the implementation of policies, projects or programmes mentioned in the questions above?

☐ Yes

☐ No

If the answer to Q18 is yes, please describe how the impact was monitored and the results.