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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 8.1 of the Provisional Agenda

Seventeenth Regular Session

Rome, 18–22 February 2019

REPORT OF THE SECOND SESSION OF THE AD HOC INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Note by the Secretariat

The Commission, at its last session, requested that a second meeting of the Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture (Working Group) be convened and requested it to review the Draft Report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*, as revised in the light of comments and inputs received. The Second Session of the Working Group was held in Rome from 23 to 25 April 2018. The Working Group considered, *inter alia*, the Draft Report and options for follow-up, and explored cross-sectoral issues, such as access and benefit-sharing, digital sequence information, the draft work plan on micro-organism and invertebrate genetic resources and the contribution of genetic resources to food security and climate change adaptation. The Working Group also reviewed and revised the *Draft Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018–2027)*. The report of the Second Session of the Working Group is contained in this document, for consideration by the Commission.

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**Food and Agriculture
Organization of the
United Nations**

COMMISSION ON
GENETIC RESOURCES
FOR FOOD AND
AGRICULTURE

CGRFA/WG-AqGR-2/18/Report

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

Rome, Italy, 23 – 25 April 2018

CGRFA/WG-AqGR-2/18/REPORT

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

REPORT OF THE SECOND SESSION

OF THE

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

Rome, Italy, 23–25 April 2018

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2018

The documents prepared for the Second Session of the Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture are available on the Internet at the following address:

<http://www.fao.org/fi/static-media/MeetingDocuments/AqGenRes/ITWG/2018/default.htm>

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I. OPENING

1. The Second Session of the Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture (Working Group) was held in Rome, Italy, from 23 to 25 April 2018. The Members and Alternates of the Working Group are listed in *Appendix G*. The list of delegates and observers is contained in *Appendix H*.

2. Mr Semoli Belemane (South Africa), Vice Chair of the Working Group, opened the session and welcomed the delegates and observers.

3. Mr Árni M. Mathiesen, Assistant Director-General, Fisheries and Aquaculture Department, Food and Agriculture Organization of the United Nations of FAO, welcomed members of the Working Group and observers. He highlighted that aquatic genetic resources (AqGR) are critically important for the work of FAO and expressed his satisfaction on behalf of the department with the collaboration with the Commission in leading the preparation of the report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture* (Report). This flagship publication would be the first global assessment based predominantly on national reporting on AqGR for food and agriculture. Mr Mathiesen further informed the Working Group that FAO has received 92 Country Reports that account for more than 90 percent of global aquaculture production. Mr Mathiesen concluded by thanking countries for submitting their reports and the participants for their contribution to this important process.

4. Mr René Castro Salazar, Assistant Director-General of the Climate, Biodiversity, Land and Water Department of FAO welcomed delegates and observers and stressed the need: (a) to address AqGR in the broader context of biodiversity; (b) for collaboration on AqGR and biodiversity between the relevant governing and statutory bodies of FAO; and (c) to implement policies on AqGR in harmony with other policies, including those addressing other genetic resources as well as the conservation and sustainable use of biodiversity.

5. Mr Castro Salazar referred the participants to another important global assessment currently being finalized by FAO, *The State of the World's Biodiversity for Food and Agriculture*. This report attempts to address ecosystem services and all biodiversity relevant for food and agriculture and, therefore, goes beyond the level of genetic resources. He concluded by wishing participants a fruitful exchange of views and a successful meeting.

6. Ms Irene Hoffmann, Secretary, Commission on Genetic Resources for Food and Agriculture (Commission), welcomed delegates and observers. She noted that the finalization of the Report was timely in light of the fact that aquaculture is now producing more food fish than capture fisheries. Ms Hoffmann thanked the participants for their contributions and looked forward to the finalization of this significant milestone for FAO and its Members.

7. Mr Matthias Halwart, Secretary of the Working Group, welcomed the participants and stated that the Members and Observers present here, including four of the eleven top aquaculture producers globally, reflect the importance of AqGR for food and agriculture. He gratefully acknowledged the support of the Government of Germany towards the process of producing and finalizing the Report.

II. ELECTION OF CHAIR, VICE-CHAIR(S) AND RAPPORTEUR

8. The Working Group elected Ms Ingrid Olesen (Norway) as Chair of the Working Group. Mr Semoli Belemane (South Africa), Mr Mohammad Pourkazemi (Iran (Islamic Republic of)), Ms Maria Inés Trucco (Argentina) and Mr Gustaf Daud Sirait (Indonesia) were elected as Vice-Chairs. Mr Mohammad Pourkazemi (Iran, Islamic Republic of) was elected *Rapporteur*.

9. The Chair informed the Working Group that, in line with Article III of the Statutes of the Working Group, Morocco and Qatar would participate in the meeting as Members.

III. ADOPTION OF THE AGENDA

10. The Working Group adopted the agenda, as given in *Appendix A*.

IV. PRESENTATION OF THE REVISED DRAFT REPORT ON *THE STATE OF THE WORLD'S AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE*

11. The Working Group considered the document, *Preparation of The State of the World's Aquatic Genetic Resources for Food and Agriculture*.¹ It took note of the *Revised Draft Report on The State of the World's Aquatic Genetic Resources for Food and Agriculture*² (Revised Draft Report) and of the *Summary of comments received on the Revised Draft Report on The State of the World's Aquatic Genetic Resources for Food and Agriculture*.³

12. The Working Group recalled that the Commission, at its last session, had called upon Governments and donors to make available the financial resources necessary for the finalization of the Report and to translate, publish, print and distribute it. It noted that FAO, in finalizing the Report would take into account the comments submitted by countries, as compiled in the document, *Summary of comments received on the Revised Draft Report on The State of the World's Aquatic Genetic Resources for Food and Agriculture*,⁴ as well as comments received during this session of the Working Group.

13. The Working Group welcomed with appreciation the progress made towards finalization of the Revised Draft Report and noted that it is based upon 92 officially endorsed Country Reports, contains data from the 11 leading aquaculture production countries and accounts for more than 90 percent of the global aquaculture production. It also noted that the Revised Draft Report addresses most of the recommendations made by the Working Group at its first session.⁵ The Working Group welcomed the participation of regional and international networks in the process of preparing the Revised Draft Report.

14. The Working Group reiterated that the scope of the Report is farmed species and their wild relatives within national jurisdiction. It recognized that the focus and data availability on production does not reflect the diversity of AqGR at global and national levels. It noted that data and information are often provided at species level, and suggested that future assessments and related capacity development in characterization and monitoring of AqGR should provide more detailed information.

15. The Working Group stressed the importance of selective breeding, cross-breeding and other approaches to aquatic genetic improvement particularly in response to drivers, such as disease resistance and suitability for intensive production methods, and recommended that this be highlighted in the Report. The Working Group also recommended that the Report reflect more comprehensively the impacts of non-native species on wild relatives and ecosystems.

16. The Working Group noted the challenges National Focal Points faced in the preparation of their Country Reports, especially as they had to consult a wide variety of relevant stakeholders. It recommended that the Commission invite countries which have not yet nominated a National Focal Point, to nominate one and to promote, in addition, the establishment of national mechanisms, including networks and working groups representing relevant stakeholders, for future reporting, stock-taking and implementation of follow-up actions.

17. The Working Group highlighted the importance of *in situ* and *ex situ* conservation, specifically live gene banking, but noted the importance of maintaining appropriate levels of genetic diversity in conservation schemes to minimize, for example, inbreeding. The Working Group discussed the

¹ CGRFA/WG-AqGR-2/18/2.

² CGRFA/WG-AqGR-2/18/Inf.2.

³ CGRFA/WG-AqGR-2/18/Inf.3.

⁵ CGRFA/WG-AqGR-1/16/Report.

conservation methods used for stock enhancement, noting the importance of minimizing selection for farm conditions to prevent potential adverse effects in the wild population. It requested these topics to be addressed in the Report and its key messages.

18. The Working Group noted the need for clarification in the Report of the concepts of *in situ* and *ex situ* conservation, especially with regard to *in situ* conservation on-farm and through stock enhancement. The Working Group also noted the challenges of some countries to carry out *in situ* and *ex situ* conservation programmes, and recommended that the Commission request FAO to support countries, upon request and subject to the availability of financial resources, through technology transfer and capacity development.

19. The Working Group noted the importance of open-source, peer-reviewed scientific literature as a cost-effective mechanism for sharing information related to AqGR among stakeholders. The Working Group recommended the inclusion in the Report of information on networks that address AqGR, e.g. the International Network for Genetics in Aquaculture and the General Fisheries Commission for the Mediterranean.

20. The Working Group recommended that the impact of international agreements on stakeholders be more fully elaborated, either in form of text or a table, modelled after the existing Table 9.6.⁵

21. The Working Group recommended that FAO review the Revised Draft Report to ensure clarity and accuracy. More specifically, it recommended that:

- a. terms be harmonized throughout the Report, and that the Report adhere to established definitions, where they exist;
- b. linguistic issues be addressed through copy-editing;
- c. usage of descriptive categories be harmonized throughout the Report;
- d. text, figures and table titles are accurate and match with their contents and original Country Reports; and
- e. findings are attributed correctly to farmed species, wild relatives, or the broader AqGR.

22. The Working Group recommended that the Commission, at its next regular session, take note of the finalized Report. It also recommended that a brief summary of the Report be prepared in all FAO languages and widely distributed, including, in particular to policy makers.

V. OPTIONS FOR FOLLOW-UP TO THE STATE OF THE WORLD'S AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

23. The Working Group considered the document, *Options for follow-up to The State of the World's Aquatic Genetic Resources for Food and Agriculture*.⁶ The Working Group noted that the Commission's Multi-Year Programme of Work (MYPOW) foresees, as a major output/milestone for its 18th Regular Session, the "Follow-up to *The State of the World's Aquatic Genetic Resources for Food and Agriculture*".

24. The Working Group welcomed the objectives and list of strategic priority actions⁷ as follow-up to the Report. The Working Group recommended to further develop the strategic priorities along the following lines:

⁵ CGRFA/WG-AqGR-2/18/Inf.2, page 201.

⁶ CGRFA/WG-AqGR-2/18/3.

⁷ See CGRFA/WG-AqGR-2/18/3, Table 1.

- a. The strategic priorities should emphasize the importance of capacity-building in the development, use and conservation of AqGR and related information and of financial resources, training and education to enable more countries to benefit from and sustainably use AqGR;
 - b. The Working Group noted that the development of the aquaculture sector is uneven across FAO Members and recommended that the strategic priorities stress the need for a review of relevant policies and national programmes and priorities with a view to create an enabling environment and mobilize the necessary human and financial resources for the sustainable use and exchange of AqGR and associated technologies, such as selective breeding;
 - c. The strategic priorities should reflect the need for the development of inclusive national programmes on AqGR that include relevant stakeholders, including resource managers, geneticists and development agencies;
 - d. The strategic priorities should emphasize the important role women play in the use and conservation of AqGR and recommend that special efforts be made to include women and women's cooperatives in programmes on AqGR management;
 - e. Raising awareness and increasing knowledge and capacity of AqGR, including through the development of case studies that demonstrate how genetic technologies and associated knowledge can be used to increase food security, economic development and conservation of AqGR, should be a strategic priority; and
 - f. The strategic priorities should stress the need for follow-up actions to be voluntary, collaborative, and based on national needs and priorities; they should avoid duplication with other actions of FAO and other agencies.
25. The Working Group recommended the development of voluntary guidelines and frameworks for:
- a. international, regional and national networks on AqGR;
 - b. gene banking;
 - c. stock enhancement; and
 - d. broodstock management and improvement.
26. The Working Group acknowledged the rapid development of modern genetic technologies and their potential contribution to food security and economic development. It noted that these technologies and related information are expensive to use, require high levels of human capacity and therefore may not be available to many countries. The Working Group stressed the important role that traditional technologies, especially selective breeding, and other technologies, such as hybridization and genotyping through polymorphic DNA markers, may play in increasing aquaculture production and recommended that these technologies be promoted widely.
27. The Working Group recommended regional consultations on AqGR be organized to identify possible follow-up activities to the Report and refinement of the strategic priority actions, subject to the availability of the necessary funds.
28. The Working Group recommended to assess, explore and develop mechanisms to monitor the status and trends of AqGR including, as appropriate, through the establishment of a global information system and a registry of farmed types as well as stocks of wild relatives, subject to the availability of the necessary funds. Submission of information to the global information system should be voluntary.
29. The Working Group recommended a further review and revision, as appropriate, of the possible follow-up activities, including preparations for a draft Global Plan of Action on AqGR, in close collaboration with the Committee on Fisheries Sub-Committee on Aquaculture (COFI: AQ) and the COFI Advisory Working Group (COFI AWG), and taking into account inputs received from the regional

consultations, with a view to submit a draft Global Plan of Action on AqGR to the Commission, for consideration at its 18th Regular Session.

30. The Working Group noted the importance of sustained funding for the development, use and conservation of AqGR and recommended that the Commission call on donors and the international development community to make resources available for these important activities.

VI. REPORT OF THE SECOND SESSION OF THE COMMITTEE ON FISHERIES ADVISORY WORKING GROUP ON AQUATIC GENETIC RESOURCES AND TECHNOLOGIES

31. The Working Group considered the documents, *Summary of the Report of the Second Session of the Committee on Fisheries Advisory Working Group on Aquatic Genetic Resources and Technologies*⁸ and *Report of the Second Session of the Committee on Fisheries Advisory Working Group on Aquatic Genetic Resources and Technologies*.⁹ The Working Group acknowledged the work done by the COFI AWG, and recommended continued collaboration.

32. The Working Group noted and supported the recommendations of the COFI AWG related to the preparation of the Report and related documents.

33. The Working Group requested the Commission to invite COFI, the COFI:AQ and the COFI AWG to consider the document entitled *Report of the Second Session of the Committee on Fisheries Advisory Working Group on Aquatic Genetic Resources and Technologies* as a contribution to the discussion of options for follow-up to the Report.

VII. ACCESS AND BENEFIT-SHARING FOR AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

34. The Working Group considered the document, *Draft explanatory notes describing, within the context of the ABS Elements, the distinctive features of aquatic genetic resources for food and agriculture*¹⁰ and took note of relevant information documents.¹¹

35. The Working Group stressed that the relevance of several distinctive features of genetic resources for food and agriculture, as identified in *Appendix B*, to AqGR depends on the species (for example D.1; D.2; E.4). The Working Group therefore recommended to consider a third category (marked in the table by minus/plus signs [-/+]) to reflect that certain AqGR display a specific feature whereas others do not. The Working Group also noted that traditional knowledge associated with AqGR for food and agriculture is indirectly reflected in some of the distinctive features (C.1; D.1-D.4; F.1).

36. The Working Group reviewed and revised the draft explanatory notes, as given in *Appendix C*, for further consideration by the Team of Technical and Legal Experts on Access and Benefit-sharing and the Commission, at their next sessions. It is recommended that fisheries and aquaculture expertise be duly consulted. It took note of the on-going discussions, in various fora, on the application of access and benefit-sharing measures to “digital sequence information” and stressed the importance of addressing this topic in the explanatory notes, taking into account the wide range of views.

⁸ CGRFA/WG-AqGR-2/18/4.

⁹ CGRFA/WG-AqGR-2/18/Inf.4.

¹⁰ CGRFA/WG-AqGR-2/18/5.

¹¹ CGRFA/WG-AqGR-2/18/Inf.6; CGRFA/WG-AqGR-2/18/Inf.7; CGRFA/WG-AqGR-2/18/Inf.8; CGRFA/WG-AqGR-2/18/Inf.9.

VIII. “DIGITAL SEQUENCE INFORMATION” ON AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

37. The Working Group considered the document, *Review of the draft exploratory fact-finding scoping study on “digital sequence information” on genetic resources for food and agriculture*¹² and took note of the *Draft exploratory fact-finding scoping study on “digital sequence information” on genetic resources for food and agriculture*.¹³

38. The Working Group noted that the term “digital sequence information” is taken from Decision XIII/16 of the Thirteenth Meeting of the Conference of the Parties to the Convention on Biological Diversity and is subject to further discussion. It noted that the Commission at its last session recognized “that there are a multiplicity of terms that have been used in this area (including, inter alia, “genetic sequence data”, “genetic sequence information”, “genetic information”, “dematerialized genetic resources”, “in silico utilization”, etc.) and that further consideration is needed regarding the appropriate term or terms to be used.”¹⁴

39. The Working Group reviewed the draft exploratory fact-finding scoping study and provided inputs. It noted that the study should not go beyond the scope, as defined by the Commission at its last session, and cautioned against drawing firm conclusions or offering recommendations at this early stage of the Commission’s consideration of “digital sequence information”.

40. The Working Group noted with appreciation the inclusion of important applications of “digital sequence information” in the areas of fish product certification, labelling and traceability and recommended that more detailed information be compiled with a view to assess the relevance of “digital sequence information” on AqGR for food production and its implications for the subsector in the foreseeable future.

41. The Working Group noted that while capacity in genome sequencing and DNA synthesis is increasing, the direct costs, infrastructure requirements and training remain significant barriers to researchers in developing countries. The Working Group therefore stressed the need for capacity-building to allow developing countries to make use of and benefit from “digital sequence information”.

IX. DRAFT WORK PLAN FOR FUTURE WORK ON SUSTAINABLE USE AND CONSERVATION OF MICRO-ORGANISM AND INVERTEBRATE GENETIC RESOURCES FOR FOOD AND AGRICULTURE

42. The Working Group considered the *Draft work plan for the sustainable use and conservation of micro-organism and invertebrate genetic resources for food and agriculture*.¹⁵ It welcomed the draft work plan as timely response to the importance of micro-organisms and invertebrate genetic resources and their relevance to the aquaculture sector.

43. The Working Group acknowledged the importance of the participation of all stakeholders involved in the sustainable use and conservation of micro-organisms and invertebrate genetic resources to strengthen the Commission’s work in this sector. It noted that the production of microbes and invertebrates offers opportunities for collaboration with the private sector and job creation.

44. In addition to priority areas identified by the Commission at its last session (pollinators, in particular honey bees; soil micro-organisms and invertebrates; biological control agents;

¹² CGRFA/WG-AqGR-2/18/6.

¹³ CGRFA/WG-AqGR-2/18/Inf.10.

¹⁴ CGRFA-16/17/Report Rev.1, paragraph 86.

¹⁵ CGRFA/WG-AqGR-2/18/7/Rev.1.

microorganisms of relevance to ruminant digestion; and micro-organisms of relevance to food processing and agro-industrial processes),¹⁶ the Working Group recommended to include in the work plan further areas of work, namely on holobiomes, micro-algae, aquatic micro-organisms for environmental damage remediation, and micro-organisms for water purification, including in the aquaculture industry. It also recommended to expand the focus on micro-organisms of relevance to digestion of animals other than ruminants, and to micro-organisms for use by the animal and human health sectors.

X. DRAFT REVISED STRATEGIC PLAN FOR THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE (2018–2027)

45. The Working Group reviewed and revised the document, *Draft Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018–2027)*.¹⁷

46. The Working Group noted the progress made in other sectors of genetic resources for food and agriculture (GRFA) and recommended to revise the MYPOW and Session planning, as contained in *Appendices D and E*. It noted that the proposed cross-sector goals of the Commission build on the global assessments prepared under its guidance, the strategic priority areas, long-term goals and targets of the Commission's global action plans and other Commission activities taken in response to the global assessments, and recommended that there should be no additional reporting burden on countries.

47. The Working Group recommended that the Commission update the MYPOW and Session planning on a regular basis and review the Strategic Plan as necessary. It further recommend that the Commission consider in the future the reporting on sectoral indicators as part of the sectoral sections of the MYPOW; and request FAO to apply existing indicators and continue developing indicators, as appropriate.

XI. CLOSING STATEMENTS

48. The Chair thanked the delegates, Vice-Chairs and the *Rapporteur*, as well as the observers, for their important inputs and commended the Working Group for the recommendations adopted during the session. She acknowledged the work of FAO staff, including those working behind the scenes.

49. Ms Irene Hoffmann, Secretary, Commission on Genetic Resources for Food and Agriculture, recognized the milestones achieved in this meeting, such as the guidance received regarding the finalization of the Report and the development of a Global Plan of Action. She thanked delegates for their hard work, good spirit, clarity and willingness to compromise and the Chair for her wisdom and guidance. Mr Matthias Halwart, Secretary of the Working Group, appreciated the clear recommendations towards follow-up actions, particularly the new call for drafting a Global Plan of Action. He acknowledged the significant amount of future work and stressed the need for further resources from the international community. He valued the Working Group's guidance and confirmed FAO's continued commitment to support countries' work on AqGR.

¹⁶ CGRFA/16/17/Report, paragraph 79.

¹⁷ CGRFA/WG-AqGR-2/18/8/Rev.1.

APPENDIX A**AGENDA OF THE SECOND SESSION OF THE AD HOC INTERGOVERNMENTAL
TECHNICAL WORKING GROUP ON AQUATIC GENETIC RESOURCES FOR FOOD AND
AGRICULTURE**

- 1) Opening
- 2) Election of Chair, Vice-Chair(s) and Rapporteur
- 3) Adoption of the agenda and timetable
- 4) Presentation of the Revised Draft Report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*
- 5) Options for follow-up to *The State of the World's Aquatic Genetic Resources for Food and Agriculture*
- 6) Report of the Second Session of the Committee on Fisheries Advisory Working Group on Aquatic Genetic Resources and Technologies
- 7) Access and benefit-sharing for aquatic genetic resources for food and agriculture
- 8) “Digital sequence information” on aquatic genetic resources for food and agriculture
- 9) Draft work plan for future work on sustainable use and conservation of micro-organism and invertebrate genetic resources for food and agriculture
- 10) Draft Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018–2027)
- 11) Any other business
- 12) Adoption of the Report

APPENDIX B

DISTINCTIVE FEATURES OF AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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 and aquatic ecosystems respectively.	+
B. The role of human management	B.1 (a) The existence of most GRFA is closely linked to human activity and (b) 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 interdependence	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.	+
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 (a) GRFA are held and used by a broad range of very diverse stakeholders. (b) 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 <i>ex situ</i> .	-/+
	E.5 An important part of GRFA is conserved <i>in situ</i> 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 (a) While the overall benefits of GRFA are very high, (b) 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.	+

The Working Group, 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 to AqGR (marked in the table above by plus signs [+]) or less (or not) relevant to AqGR (marked in the table by minus signs [-]) or relevant to certain AqGR, while less relevant to others (marked in the table by minus/plus signs [-/+]).

APPENDIX C**EXPLANATORY NOTES, DESCRIBING WITHIN THE CONTEXT OF THE ABS ELEMENTS, THE DISTINCTIVE FEATURES OF AQUATIC GENETIC RESOURCES FOR FOOD AND AQUACULTURE**

The Working Group revised draft explanatory notes, as given below, for further consideration by the Team of Technical and Legal Experts on Access and Benefit-sharing and the Commission, at their next sessions.

Background information on aquaculture¹⁸

1. ABS policy-makers may find it useful to receive some background information on the use and exchange of AqGR. Explanatory notes should therefore explain that:

Aquaculture is a relatively new industry, with major developments having occurred in the last 60 years, although there are some forms such as carp farming that can be traced back thousands of years. The growth rate of aquaculture has been 8 – 10 percent per annum for the last 20 years, and today 50 percent of finfish consumed are farmed. Farmed finfish production now exceeds beef production worldwide. While aquaculture in marine and coastal areas gains importance, the overwhelming majority of global aquaculture production is still from inland areas.

Two parallel approaches are taken to satisfy consumer demand and increase food supply: domestication of new species and effective genetic management and genetic improvement of species that are already produced commercially. The number of species items registered with production data by FAO grew from 70 in 1950 to almost 600 in 2018. Some of the most commonly farmed species are salmonids, tilapias, carps, oysters and shrimp, representing three major taxonomic groups: finfish, bivalve shellfish and decapod crustaceans.

Genetic improvement of domesticated fish is still nascent, but the rapid development of the industry is increasingly dependent on the use and exchange of AqGR. Different kinds of genetic technologies are used to improve production including captive breeding, selective breeding, hybridisation and chromosome set manipulation. Genetic modification has been used only to a very limited extent. Since aquaculture and genetic improvement of AqGR is such a new undertaking, many farmed species are genetically very close to their wild relatives. Thus, the wild type, i.e. the non-domesticated and non-genetically improved type, continues to play an important role in aquaculture production and breeding. In some cases these stocks may be in a poor conservation status. The reliance on the wild type in aquaculture thereby provides an incentive to conserve these species and their habitats.

An exception to the continued need for wild species for aquaculture production is the production of some of the most commonly farmed species, such as Atlantic salmon and white-leg shrimp. For those, the need for genetic infusion from the wild has been nearly eliminated, and genetic improvements take place through breeding programmes and exchanges between commercial breeders. This applies only to the small number of species now subject to industrialised aquaculture.

The main source of genetically improved AqGR for aquaculture of these species are large commercial farms or breeding centres. In aquaculture small farmers have not had the opportunity to domesticate and genetically improve species for thousands of years like in agriculture. The recent rapid developments in genetic improvement, in particular in the case of salmon and shrimp, has relied on funding and technology, and access to improved AqGR, and is often in the hands of larger businesses. Gene banks for AqGR are still scarce, and publicly financed gene banks are generally available only for a few of the most commonly used species in aquaculture.

¹⁸ See also Background Study Paper No. 45.

Aquaculture has a high number of stakeholders along the supply chain from genetic improvement to farming and the sale of products ranging from smallholder producers to large-scale companies. While AqGR are primarily used for food production, they are also used for other purposes such as production of fish and other animals to be released into natural or modified waters for restocking and stock enhancement, as bait fish for both commercial and recreational fisheries and farming of ornamental fish.

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

2. The ABS Elements recommend to consult government entities and non-governmental stakeholders holding, providing or using GRFA.¹⁹ Explanatory notes should explain that:

The competent authority for ABS will often not be the authority which is responsible for aquaculture/fisheries. As most stakeholders in aquaculture have limited knowledge of ABS and the implications of ABS for their sector, consultations could help to raise the awareness of the subsector and allow policy- and decision-makers to get an insight into the specificities of aquaculture research and development and existing use and exchange practices of the subsector.

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

3. The ABS Elements recommend to consider ABS for GRFA in the wider context of sustainable agricultural development and food security.²⁰ Explanatory notes should therefore explicitly refer to policies and legislation in the areas of food security and aquaculture which could either integrate or refer to relevant provisions for ABS for AqGR:

Aquaculture is an adaptive and resilient farming practice that provides both direct and indirect benefits in terms of food security and poverty alleviation. In many developing countries, fish provide a significant source of high quality animal protein and often farmed fish is traded and consumed locally. Besides, poverty can be reduced and food security increased through the economic activity that aquaculture brings to communities regardless of whether the fish is consumed locally. Both fish farming itself and the industry processing farmed fish, may provide employment opportunities for large numbers of people in developing countries including rural women. Thus, ABS measures for AqGR should form part of broader food security considerations and relevant policies, including habitat policies.

While the rapid development of the aquaculture industry has implied that environmental, veterinary and sanitary regulation have not always followed suit, regulations are increasingly being introduced. This includes the regulation of introductions of AqGR from other countries and ecosystems. Such regulations, including legislative, administrative and policy measures as well as codes of practice could be used to address or could make reference to ABS for AqGR, with a view to reduce the bureaucratic burden and streamline administrative procedures.

Integration of implementation of ABS measures into the institutional landscape

4. ABS measures often cut across different sectors of genetic resources and GRFA, which are often the responsibility of different ministries and competent authorities. The ABS Elements recommend to identify existing institutional arrangements that may be used to address ABS.²¹ Explanatory Notes should explain that:

Adaptation to distinctive features of sectors and for sectoral competent authorities can be beneficial. Thus, a result of the consultations between the responsible ministries, the central

¹⁹ ABS Elements, paragraph 15.II.

²⁰ ABS Elements, paragraph 15.III.

²¹ ABS Elements, paragraph 30.

ABS competent authority and the aquaculture authority could be a delegation of ABS competence to the latter for ABS related to AqGR.

Flows of germplasm, including international flows [and possible gaps in ABS measures]

5. The ABS Elements recommend that in developing, adapting and implementing ABS measures, the relevance of germplasm flows should be considered.²² Explanatory notes should explain that:

Aquaculture is an important and expanding industry in both developing and developed countries. The flows of germplasm go in all directions: South-North, North-South, South-South and North-North.

Chile, for example, is the second largest producer of farmed salmon although salmon does not occur naturally in the southern hemisphere. African tilapia is mainly produced in Asia, and the Pacific oyster, which is the basis for the oyster industry both in North America and Europe, was introduced from Japan. Due to the growing number of species being domesticated, international exchanges of AqGR for food and agriculture are expected to increase in numbers and quantity.

Possible implications of the scope of ABS measures

6. The ABS Elements stress that ABS measures need to be clear as to which GRFA are covered by relevant access provisions and which not.²³ This consideration applies likewise to the temporal and the subject-matter scope of ABS measures. Explanatory notes could explain that:

Aquaculture is a predominantly new industry still dependent on wild species and with few and newer *ex situ* facilities for genetic resources. Because of the newness of the industry, the temporal scope of ABS measures is a less relevant topic for aquaculture than for other GRFA, such as crop plants.

AqGR often reach the market in a form in which they may be used both as “biological resource” (e.g., for human consumption) or as a genetic resource (i.e. for research and development, including breeding). Regulating access to AqGR used as “biological resource” may have significant impact on trade of fish and aquatic plant commodities. Several ABS laws leave the exchange of biological resources unregulated; however, if a biological resource is suddenly used for research or development, they require the user to request a permit and to share potential benefits.

Development of AqGR in the course of aquaculture

7. Access to genetic resources for their “utilization”, as defined by the Nagoya Protocol, will usually trigger the application of ABS measures. “Utilization”, according to the Nagoya Protocol, means “to conduct research and development on the genetic and/or biochemical composition of genetic resources”.²⁴ The ABS Elements point out that it may be difficult in some cases to decide whether a GRFA is utilized within the meaning of the Nagoya Protocol.²⁵ Explanatory notes could explain:

While practices, such as the capture of live material from the wild and its subsequent use in aquaculture, usually termed as capture-based aquaculture (CBA), might clearly not qualify as “research and development” and therefore not trigger the application of ABS measures, aquaculture may simultaneously contribute to genetic improvement and therefore be considered “research and development.” ABS measures should therefore draw a clear line between activities related to AqGR that are considered “utilization” and those which are not.

Standardization of PIC and MAT (mutually agreed terms)

8. The ABS Elements encourage governments to consider the different options of authorization procedures, including the option of standardizing procedures, terms and conditions. The ABS

²² ABS Elements, paragraph 15 I.e.

²³ ABS Elements, paragraph 36.

²⁴ Nagoya Protocol, Article 2.

²⁵ ABS Elements, paragraphs 46–48.

Elements refer to the Standard Material Transfer Agreement of the Treaty, as an example. Explanatory notes could explain that:

Currently, the exchange of genetic resources is primarily regulated through private law business contracts. Because most genetically improved aquatic species are fertile and can be easily reproduced, contracts often restrict the use of AqGR and prohibit their use for rival breeding programs. Current business practices in the aquaculture industry may provide inspiration for the design of the terms and conditions of ABS agreements for AqGR.

Despite the limited attention to ABS in the aquaculture sector, there have certainly been cases where the provider of the original AqGR benefited from the results of research and development performed by a third party on the AqGR. Sharing research and development results with the provider of AqGR will therefore often be a standard condition of ABS agreements.

APPENDIX D
MULTI-YEAR PROGRAMME OF WORK: MAJOR OUTPUTS AND MILESTONES
(2018–2027)

	17 th Session 2019	18 th Session 2021	19 th Session 2023	20 th Session 2025	21 st Session 2027
Sectoral matters					
Animal genetic resources		Review of implementation of the Global Plan of Action for Animal Genetic Resources		Presentation of <i>The Third Report on the State of the World's Animal Genetic Resources for Food and Agriculture</i>	Review of the Global Plan of Action for Animal Genetic Resources
Aquatic genetic resources	Presentation of the finalized <i>State of the World's Aquatic Genetic Resources for Food and Agriculture</i>	Consideration of draft <i>Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture</i>		Review of implementation of the <i>Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture</i>	
Forest genetic resources	Review of implementation of the <i>Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources</i>		Presentation of <i>The Second Report on the State of the World's Forest Genetic Resources</i>	Review of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources	
Micro-organisms and invertebrates		Review of work on micro-organisms and invertebrates		Review of work on micro-organisms and invertebrates	
Plant genetic resources	Review of status and trends of seed policies		Presentation of <i>The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture</i>	Review of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture	Review of implementation of the (Second) Global Plan of Action for Plant Genetic Resources for Food and Agriculture
Cross-sectoral matters					
<i>The State of the World's Biodiversity for Food and Agriculture</i>	Follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>		Follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>		Presentation of <i>The Second Report on the State of the World's Biodiversity for Food and Agriculture</i>
Access and benefit-sharing (ABS)	Develop explanatory notes for subsectors of GRFA to complement the ABS Elements	Review of work on ABS		Review of work on ABS	
Biotechnologies		Review of the work on biotechnologies for the conservation and sustainable utilization of GRFA		Review of the work on biotechnologies for the conservation and sustainable utilization of GRFA	
"Digital sequence information on GRFA"	Consider the use of "digital sequence information on GRFA" and the potential implications for conservation, sustainable use and ABS of GRFA		Consider the use of "digital sequence information on GRFA" and the potential implications for conservation, sustainable use and ABS of GRFA		
Climate change		Review of work on climate change and GRFA	Review of a country-driven global assessment of climate change effects and genetic resource adaptation and mitigation measures	Review of work on climate change and GRFA	
Nutrition and Health	Review of work on GRFA and nutrition	Concept note on biodiversity for food and agriculture and human health	Review of work on GRFA and nutrition and health		Review of work on GRFA and nutrition and health
Management	Progress report/review of the Strategic Plan		Progress report/review of the Strategic Plan		Progress report/review of the Strategic Plan

* The term is taken from decision CBD COP XIII/16 and is subject to further discussion. There is a recognition that there are a multiplicity of terms that have been used in this area (including, *inter alia*, "genetic sequence data", "genetic sequence information", "genetic information", "dematerialized genetic resources", "*in silico* utilization", etc.) and that further consideration is needed regarding the appropriate term or terms to be used.

APPENDIX E
SESSION PLANNING FOR CGRFA-18

Activities in preparation of CGRFA-18 (2020/2021)

Sectoral matters	
Animal genetic resources	<ul style="list-style-type: none"> • Prepare draft outline, timeline and budget and develop process for collecting national data to support the preparation of <i>The Third Report on the State of the World's Animal Genetic Resources for Food and Agriculture</i> • Prepare synthesis progress report to provide a global overview of progress made to implement the Global Plan of Action • Prepare FAO progress report on the implementation of the Global Plan of Action and the Funding Strategy • Prepare international organizations progress report • Prepare brief report on the status and trends of animal genetic resources
Aquatic genetic resources	<ul style="list-style-type: none"> • Consider draft <i>Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture</i>
Forest genetic resources	<ul style="list-style-type: none"> • Prepare FAO progress report on the implementation of the Global Plan of Action for Forest Genetic Resources • Prepare an update on the preparation of Second Implementation Report and <i>The Second Report on the State of the World's Forest Genetic Resources</i> (including collection of national data)
Micro-organisms and invertebrates	<ul style="list-style-type: none"> • Review of work on micro-organisms and invertebrates • Follow-up on previous recommendations by the Commission on this matter
Plant genetic resources	<ul style="list-style-type: none"> • Prepare FAO progress report on the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture • Prepare update on the preparation of <i>The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture</i>
Cross-sectoral matters	
<i>The State of the World's Biodiversity for Food and Agriculture</i>	<ul style="list-style-type: none"> • Prepare progress report on the implementation of the follow-up to <i>The State of the World's Biodiversity for Food and Agriculture</i>
Access and benefit-sharing	<ul style="list-style-type: none"> • Prepare review of existing access and benefit-sharing instruments and their impact on genetic resources for food and agriculture and define future work • Follow-up on previous recommendations by the Commission on this matter
Biotechnologies	<ul style="list-style-type: none"> • Review of work on biotechnologies for the conservation and sustainable utilization of genetic resources for food and agriculture
'Digital sequence information'	<ul style="list-style-type: none"> • Follow-up on previous recommendations by the Commission on this matter
Climate change	<ul style="list-style-type: none"> • Status of preparation of the global assessment of the role of genetic resources for food and agriculture for climate change adaptation and mitigation • Follow-up on previous recommendations by the Commission on this matter
Food security, nutrition and health	<ul style="list-style-type: none"> • Follow-up on previous recommendations by the Commission on this matter • Concept note on biodiversity for food and agriculture and human health
Management	<ul style="list-style-type: none"> • Prepare progress report of the Strategic Plan, MYPOW review
Other matters	<ul style="list-style-type: none"> • Invite international instruments and organizations to report on their work in supporting the activities of the Commission and collate their inputs

APPENDIX F
LIST OF DOCUMENTS

Working documents

Document symbol	Title
CGRFA/WG-AqGR-2/18/1	Provisional agenda
CGRFA/WG-AqGR-2/18/1 Add.1	Provisional annotated agenda and timetable
CGRFA/WG-AqGR-2/18/2	Preparation of <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>
CGRFA/WG-AqGR-2/18/3	Options for follow-up to <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>
CGRFA/WG-AqGR-2/18/4	Summary of the report of the Second Session of the Committee on Fisheries Advisory Working Group on Genetic Resources and Technologies
CGRFA/WG-AqGR-2/18/5	Draft explanatory notes describing, within the context of the ABS elements, the distinctive features of aquatic genetic resources for food and agriculture
CGRFA/WG-AqGR-2/18/6	Review of the <i>Draft exploratory fact-finding scoping study on "digital sequence information" on genetic resources for food and agriculture</i>
CGRFA/WG-AqGR-2/18/7/Rev.1	Draft work plan for the sustainable use and conservation of micro-organism and invertebrate genetic resources for food and agriculture
CGRFA/WG-AqGR-2/18/8/Rev.1	Draft <i>Revised Strategic Plan for the Commission on Genetic Resources for Food and Agriculture (2018–2027)</i>

Information documents

Document symbol	Title
CGRFA/WG-AqGR-2/18/Inf.1	Statutes of the <i>Ad hoc</i> Intergovernmental Technical Working Group on Aquatic Genetic Resources, and Members and Alternates elected by the Commission at its Sixteenth Regular Session
CGRFA/WG-AqGR-2/18/Inf.2	Revised Draft Report on <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i>
CGRFA/WG-AqGR-2/18/Inf.3	Summary of comments received on the Revised Draft Report on <i>the State of the World's Aquatic Genetic Resources for Food and Agriculture</i>
CGRFA/WG-AqGR-2/18/Inf.4	Report of the Second Session of the Committee on Fisheries Advisory Working Group on Genetic Resources and Technologies
CGRFA/WG-AqGR-2/18/Inf.5	Report of the Ninth Session of the COFI Sub-Committee on Aquaculture

CGRFA/WG-AqGR-2/18/Inf.6	Inputs by Members and Observers on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture
CGRFA/WG-AqGR-2/18/Inf.7	Outputs of the International Workshop on Access and Benefit-sharing for Genetic Resources for Food and Agriculture
CGRFA/WG-AqGR-2/18/Inf.8	Proceedings of the International Workshop on Access and Benefit-Sharing for Genetic Resources for Food and Agriculture
CGRFA/WG-AqGR-2/18/Inf.9	National Focal Point Survey on Access and Benefit-Sharing for Aquatic Genetic Resources for Food and Agriculture
CGRFA/WG-AqGR-2/18/Inf.10	Draft exploratory fact-finding scoping study on “digital sequence information” on genetic resources for food and agriculture
CGRFA/WG-AqGR-2/18/Inf.11	List of documents
CGRFA/WG-AqGR-2/18/Inf.12	List of delegates and observers

APPENDIX G

**MEMBERS AND ALTERNATES OF THE AD HOC INTERGOVERNMENTAL
TECHNICAL WORKING GROUP ON AQUATIC GENETIC RESOURCES FOR FOOD
AND AGRICULTURE, ELECTED BY THE COMMISSION AT ITS SIXTEENTH
REGULAR SESSION**

<i>Composition (no. of countries per region)</i>	<i>Country</i>
Africa (5)	Algeria Cameroon Comoros South Africa Togo <i>First Alternate:</i> Malawi <i>Second Alternate:</i> Morocco
Asia (5)	India Indonesia Japan Malaysia Sri Lanka <i>First Alternate:</i> Lao People's Democratic Republic <i>Second Alternate:</i> Philippines
Europe (5)	Czechia Germany Hungary Poland Norway
Latin America and the Caribbean (5)	Argentina Brazil Ecuador Panama Venezuela (Bolivarian Republic of) <i>First Alternate:</i> Saint Lucia <i>Second Alternate:</i> Paraguay
Near East (4)	Egypt Iran (Islamic Republic of) Iraq Kuwait <i>First Alternate:</i> Yemen <i>Second Alternate:</i> Qatar
North America (2)	Canada United States of America
Southwest Pacific (2)	Palau Tonga <i>First Alternate:</i> Solomon Islands <i>Second Alternate:</i> Marshall Islands

APPENDIX H

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INTERGOVERNMENTAL
ORGANIZATIONS**

**OBSERVATEURS D'ORGANISATIONS
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**OBSERVADORES DE LAS
ORGANIZACIONES
INTERGUBERNAMENTALES**

**NETWORK OF AQUACULTURE
CENTRES IN ASIA AND PACIFIC
RÉSEAU DE CENTRES
D'AQUACULTURE POUR LA RÉGION
ASIE ET PACIFIQUE
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