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# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## Item 8.3 of the Provisional Agenda

### Seventeenth Regular Session

Rome, 18–22 February 2019

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

### TABLE OF CONTENTS

	Paragraphs
I. Introduction .....	1–3
II. Background .....	4–6
III. Rationale of <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i> and follow-up .....	7–14
IV. Objectives, principles and overall structure of follow-up action on aquatic genetic resources .....	14–19
V. Intersessional consultations .....	20
VI. Guidance sought .....	21

*Appendix: Potential strategic priorities for follow-up actions on aquatic genetic resources for food and agriculture*

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CGRFA 17

## I. INTRODUCTION

1. The Multi-Year Programme of Work (MYPOW) of the Commission on Genetic Resources for Food and Agriculture (Commission) foresees, as a major output/milestone for its Eighteenth Regular Session, the *Follow-up to The State of the World's Aquatic Genetic Resources for Food and Agriculture*. The Commission may therefore wish to have a first discussion on possible follow-up actions with a view to decide on the way forward, to facilitate relevant intersessional activities, and to discuss, at its next session, concrete actions.
2. The Commission's Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture (Working Group), at its Second Session, reviewed options for follow-up actions and made a series of recommendations.<sup>1</sup> It also recommended to prepare, in close collaboration with the Committee on Fisheries Sub-Committee on Aquaculture (COFI:AQ) and the COFI Advisory Working Group on Aquatic Genetic Resources and Technologies (COFI Working Group), a draft Global Plan of Action on Aquatic Genetic Resources for Food and Agriculture, taking into account inputs received from regional consultations, with a view to submit a draft Global Plan of Action to the Commission, for consideration at its next session.<sup>2</sup>
3. This document recapitulates briefly the purpose of the report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. It then identifies, based on the Report, specific areas in which further action by the Commission could enhance and strengthen the sustainable use and conservation of aquatic genetic resources (AqGR). The document finally proposes options to develop a strategic response to the Report.

## II. BACKGROUND

4. FAO, through the work of the Commission, Working Group, the Committee on Fisheries (COFI), its COFI:AQ and its COFI Working Group, plays an important role in the promotion of the responsible use, management, development and conservation of AqGR.
5. The Commission oversees and guides the preparation of global assessments of genetic resources for food and agriculture. To date, two global assessments have been prepared for (crop) plant (1997, 2009), two for (livestock) animal (2007, 2015) and one for forest genetic resources (2013).<sup>3</sup> The finalization and launch of two additional global assessments, *The State of the World's Biodiversity for Food and Agriculture* and *The State of the World's Aquatic Genetic Resources for Food and Agriculture* (Report) will take place in 2019.<sup>4</sup> All the assessments have been prepared through a participatory, country-driven processes and facilitated the translation of gaps and needs identified into national, regional and international strategic priorities.<sup>5</sup>
6. The identification of "key messages" and associated needs and challenges formed an essential part of the preparation of the Report. It is now essential to seize the opportunity of the publication of the Report to consider the need for action to respond to its findings and to agree on strategic priorities for the conservation, sustainable use and development of AqGR. The Commission may also wish to consider at some stage mechanisms that will allow it to monitor the status and trends of farmed aquatic genetic resources and their wild relatives within national jurisdiction in the future and to oversee, through the Members of the Commission and Working Group, the implementation of agreed follow-up actions.

## III. RATIONALE OF THE STATE OF THE WORLD'S AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE AND FOLLOW-UP

7. For the first time, the Report provides a comprehensive global assessment of, *inter alia*, the status, use and exchange, drivers and trends, conservation efforts, stakeholders, policies and legislation, research, education, training and extension, and international collaboration relevant to

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<sup>1</sup> CGRFA-17/19/8.1, paragraphs 24–25.

<sup>2</sup> CGRFA-17/19/8.1, paragraph 29.

<sup>3</sup> <http://www.fao.org/cgrfa/assessments/global-assessments/en/>

<sup>4</sup> CGRFA-17/19/8.2/Inf.1.

<sup>5</sup> <http://www.fao.org/cgrfa/policies/global-instruments/gpa/en/>

AqGR. It is acknowledged that this Report is limited in scope to AqGR that are cultured, and their wild relatives, within national jurisdictions.

8. Despite the crucial role of AqGR in contributing to global food security and sustainable livelihoods, prior information available on AqGR tended to be scattered, was generally incomplete, and the lack of standardized nomenclature resulted in poorly accessible data and information. The Report is a first and important step towards analysing, in a coherent and consistent manner, gaps in reporting aquaculture and fisheries data to FAO and in the identification of knowledge gaps regarding AqGR at levels below that of the species.

9. The Report indicates that genetic information will be increasingly important to support sustainable aquaculture and fisheries. It demonstrates that there is also an increasing body of information on genetic resources for aquaculture and on genetically distinct fish stocks and strains, and an increasing need for more information to underpin sound management. At the same time, the technical difficulties and costs associated with collecting information on genetic diversity need to be recognized. The additional burden on the capacity needs of developing countries must also be taken into account.

10. Improved knowledge of the status and trends of the conservation, sustainable use and development of AqGR will facilitate the development of more comprehensive policies, better planning and improved management of these essential resources. In light of the loss and degradation of aquatic habitats and populations resulting in genetic impoverishment, changing environmental and economic conditions and advancement of biotechnology, the publication of the Report provides an opportunity to define strategic priorities with the aim of enhancing the contribution of AqGR to food security and rural development.

11. The Report provides evidence of the largely untapped potential of the world's aquaculture sector to increase its production and efficiency through sustainable use, management, development and conservation of AqGR. The Report documents that although several genetic technologies are being used to improve production and profitability in aquaculture, the wild-type, i.e. those plants and animals with no deliberate genetic improvement or domestication, is the most commonly used farmed type. The dependence of aquaculture on wild relatives, especially for broodstock, stresses the importance of habitat conservation and the management of wild populations and non-native species.

12. Estimates have been made that, if all farmed aquatic species were effectively managed through appropriate breeding programmes, e.g. selective breeding, the expected increased demand for aquatic food could be met by aquaculture with very little extra land, feed or other resources. However, uptake of important traditional technologies for genetic improvement is limited and slow. Appropriate application of genetic improvement technologies, particularly selective breeding, is urgently needed to meet rising demand for aquatic food in a sustainable manner, and therefore deserves greater attention.

13. The Report also notes that policies and information systems generally exist for fisheries and aquaculture, but are not usually focused at the genetic level. Unlike terrestrial agriculture that over the millennia has developed recognized breeds and varieties of livestock and crops, there are few distinguished strains used in aquaculture, with these generally being poorly defined and described. Thus, countries need assistance in refining policies and developing appropriate information systems that address and monitor the diversity of farmed aquatic species at the level below that of the species, i.e. farmed types.<sup>6</sup>

14. With the finalization of the Report, the process should not stop. Instead, the momentum should be used to address, in a strategic and sustainable manner, the identified opportunities, gaps and needs.

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<sup>6</sup> "Farmed type" is defined as farmed aquatic organisms that could be a strain, hybrid, triploid, monosex group, other genetically altered form, cultivar or variety (see CGRFA/WG-AqGR-2/18/Inf.2, p. 31).

#### **IV. OBJECTIVES, PRINCIPLES AND OVERALL STRUCTURE OF FOLLOW-UP ACTIONS ON AQUATIC GENETIC RESOURCES**

15. Follow-up actions on AqGR could include key measures to address the conservation, development and sustainable use of AqGR with a view to making a significant contribution to international efforts to promote food security and sustainable development and alleviate poverty, in line with the Sustainable Development Goals (SDGs), the FAO Code of Conduct for Responsible Fisheries (CCRF) and other international commitments, instruments or frameworks, such as the ecosystem approach to fisheries and to aquaculture.

##### *Possible objectives of follow-up actions*

16. Follow-up actions, which should be voluntary, collaborative, and based on national needs and priorities could pursue various objectives, including:

- improving the identification, characterization and description of aquatic genetic resources, and their monitoring;
- promoting access to, and sharing of, information on AqGR at regional and national levels;
- ensuring the conservation of the important aquatic genetic resource diversity of both farmed types and wild relatives, for present and future generations;
- promoting the sustainable use and development of aquatic genetic resources, for food security, sustainable agriculture and human well-being in all countries;
- accelerating the appropriate application of genetic technologies for the improvement of farmed AqGR, including well designed selective breeding programmes, to deliver genetic gains to support sustainable growth in aquaculture production;
- addressing the need for the development of inclusive national programmes on AqGR that include relevant stakeholders, including resource managers, geneticists and development agencies;
- stressing the important role women play in the use and conservation of AqGR and calling for special efforts be made to include women and women's cooperatives in programmes on AqGR management;
- 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;
- protecting critical habitats for all development stages of AqGR and reversing the decline in many wild relatives of farmed aquatic species, including that caused by invasive species, and promoting ecosystem and ecoregional approaches as efficient means of promoting sustainable use and management of AqGR;
- promoting access to and the fair and equitable sharing of benefits arising from the use of AqGR;
- 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;
- assisting countries and relevant institutions in the establishment, implementation and regular review of national priorities, strategies and priorities for the sustainable use, development and conservation of AqGR;
- strengthening national programmes and enhancing institutional capacity – in particular, in developing countries and countries with economies in transition – and developing 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 AqGR;

- reviewing 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.
- calling for the development of voluntary guidelines and frameworks for:
  - international, regional and national networks on AqGR;
  - gene banking;
  - stock enhancement; and
  - broodstock management and improvement.

### *Principles*

17. Follow-up actions on AqGR could also formulate key principles, aligned with existing instruments, in particular, the FAO Code of Conduct for Responsible Fisheries, the SDGs and the Convention on Biological Diversity. The strategic priorities should be based on the recognition that countries are fundamentally interdependent with respect to AqGR, and that substantial international cooperation is of mutual benefit. They would assist countries, as appropriate, to integrate AqGR conservation and management needs into wider national policies and programmes and frameworks of action at national, regional and global levels.

### *Overall structure*

18. Follow-up actions on AqGR could be structured along the following main themes or priority areas:

- Establish and strengthen national and global characterization, monitoring and information system for AqGR
- Accelerate appropriate development of AqGR for aquaculture
- Promote sustainable use and conservation of AqGR
- Policies, institutions and capacity building

19. For each of these priority areas, the Commission may wish to formulate specific actions that governments can agree to undertake at national, regional and/or international levels to meet the objectives. These actions would be based on the key findings, needs and challenges identified in the Report. A list of tentative strategic priorities for follow-up actions the Commission could consider, at its next session, under the above priority areas is given in the Appendix to this document.

## **V. INTERSESSIONAL CONSULTATIONS**

20. The Commission may also wish to request FAO to hold consultations, including regional and online consultations that may be necessary to facilitate its deliberations on follow-up actions on AqGR. Follow-up actions could be further developed and consolidated by the Working Group, in close collaboration with the COFI:AQ and the COFI Working Group, with a view to submit, to the Commission at its Eighteenth Regular Session, a set of recommended follow-up actions, or a Global Plan of Action, for its consideration.

## **V. GUIDANCE SOUGHT**

21. The Commission may wish to:

- Review and revise the possible objectives, overall structure and list of follow-up strategic priorities to the report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*; and
- Request the Secretariat to prepare, based on the Commission's guidance and upon consultation of the regions, subject to the availability of funds, the COFI:AQ and the COFI Working Group, a draft Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture, for review by the Working Group and the Commission at their next sessions.

## APPENDIX

### POTENTIAL STRATEGIC PRIORITIES FOR FOLLOW-UP ACTIONS ON AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

The following potential strategic priorities for follow-up action, listed under the proposed priority areas, are based on the needs and challenges identified in the report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*.

#### **Priority Area 1: Establish and strengthen national and global characterization, monitoring and information system for AqGR**

Strategic Priority 1.1: Promote the globally standardized use of terminology, nomenclature and descriptions of AqGR.

Strategic Priority 1.2: Improve and harmonize reporting procedures and expand existing species-based information systems to cover unreported AqGR including ornamental species and micro-organisms.

Strategic Priority 1.3: Develop, promote and commercialize/institutionalize national, regional and global standardized information systems for the collection, validation, monitoring and reporting on AqGR below the level of species (i.e. farmed types and stocks).

#### **Priority Area 2: Accelerate appropriate development of AqGR for aquaculture**

Strategic Priority 2.1: Raise awareness and improve understanding of the properties, roles and risks of genetic technologies and their application to AqGR including traditional selective breeding and emerging technologies.

Strategic Priority 2.2: Promote greater adoption of well-managed, long-term, selective breeding programmes as a core genetic improvement technology for all major aquaculture species.

Strategic priority 2.3: Establish national species and breed development strategies and programmes to unlock the full potential of AqGR. Such strategies need to set an appropriate balance between the development of aquaculture of new species (both native and non-native), and development of farmed types of existing cultured species.

Strategic Priority 2.4: Conduct appropriate training and capacity building in genetic improvement, particularly in quantitative genetics.

#### **Priority Area 3: Promote sustainable use and conservation of AqGR**

Strategic Priority 3.1: Develop risk-based policies and controls on introductions and transfers of AqGR and implement monitoring systems to understand the impacts of non-native species and reduce their negative impacts on both farmed and wild relative AqGR.

Strategic Priority 3.2: Identify wild relative AqGR most at risk to ensure that they are managed sustainably and appropriate conservation measures are implemented where necessary.

Strategic Priority 3.3: Monitor and anticipate the current and future impacts of environmental change on AqGR and respond accordingly, for example through conservation of threatened resources and the development of climate change adapted farmed types for aquaculture.

Strategic Priority 3.4: Promote *in situ* conservation, including habitat protection and aquatic protected areas, as the primary measure to protect threatened wild relatives AqGR.

Strategic Priority 3.5: Identify threatened wild relative AqGR that are critical to aquaculture development and to wild catch fisheries and to prioritize these for *in situ* conservation.

Strategic Priority 3.6: Actively incorporate conservation of AqGR in the development of fisheries management plans, particularly for threatened species.

Strategic Priority 3.7: Aquatic protected areas should be considered in the development of *in situ* conservation of key AqGR.

Strategic Priority 3.8: Identify the priority threatened and important AqGR as candidates for effective ex situ conservation.

Strategic Priority 3.9: Develop and promote guidelines and best practices for both *in vivo* and *in vitro ex situ* conservation.

Strategic Priority 3.10: Monitor the use and exchange of AqGR for non-food use, such as ornamental species, alongside that of food fish, and identify related risks and needs.

#### **Priority Area 4: Policies, institutions and capacity building**

Strategic Priority 4.1: Support members to develop, monitor and enforce policies and good governance that adequately considers issues affecting conservation, sustainable use and development of AqGR, harmonized across sectors of government.

Strategic Priority 4.2: Develop national strategies for *in situ* and *ex situ* conservation of AqGR and their sustainable use.

Strategic Priority 4.3: Support improved national and regional communication on AqGR and raise awareness of the importance of AqGR among stakeholders from consumers to policy-makers.

Strategic Priority 4.4: Promote development of understanding of the roles of key stakeholders in AqGR, including indigenous communities and women, and their roles in the conservation, sustainable use and development of AqGR.

Strategic Priority 4.5: Support reviews of national legislation governing non-native AqGR including responsible use and exchange based on appropriate assessments of risks and access and benefit sharing specific to properties of AqGR.

Strategic Priority 4.6: Promote awareness among member countries of the role that international agreements and instruments can play in the conservation, sustainable use and development of AqGR and improve their effective implementation for positive impact.

Strategic Priority 4.7: Establish or strengthen national institutions, including national focal points, for planning and implementing AqGR measures, for aquaculture and fishery sector development.

Strategic Priority 4.8: Establish or strengthen national institutions for education and research on AqGR and promote intersectoral collaboration on their conservation, sustainable use and development.

Strategic Priority 4.9: Strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for conservation, sustainable use and development of AqGR including economic valuation, characterization, and genetic improvement.

Strategic Priority 4.10: Encourage the establishment of network activities and support the development and reinforcement of international networking and information sharing on AqGR.

Strategic Priority 4.11: Strengthen efforts to mobilize resources, including financial resources for the conservation, sustainable use and development of AqGR.