



Food and Agriculture
Organization of the
United Nations

NFIA/R1329 (En)

FAO
Fisheries and
Aquaculture Report

ISSN 2070-6987

Report of the

**REGIONAL WORKSHOP FOR EUROPE AND CENTRAL ASIA ON
THE DEVELOPMENT OF A GLOBAL INFORMATION SYSTEM OF
FARMED TYPES OF AQUATIC GENETIC RESOURCES
(INCORPORATING A REVIEW OF STRATEGIC PRIORITIES FOR A
GLOBAL PLAN OF ACTION)**

Virtual Workshop, 5–8 October 2020

Report of the
Regional Workshop for Europe and Central Asia on the Development of a Global Information System
of Farmed Types of Aquatic Genetic Resources (Incorporating a Review of Strategic Priorities for a
Global Plan of Action)

Virtual Workshop, 5–8 October 2020

Required citation:

FAO. 2021. *Report of the Regional Workshop for Europe and Central Asia on the Development of a Global Information System of Farmed Types of Aquatic Genetic Resources (Incorporating a Review of Strategic Priorities for a Global Plan of Action), Virtual Workshop, 5–8 October 2020.* FAO Fisheries and Aquaculture Report No. 1329. Rome. <https://doi.org/10.4060/cb2359en>

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISSN 2070-6987 [Print]
ISSN 2707-546X [Online]

ISBN 978-92-5-133689-2
© FAO, 2021



Some rights reserved. This work is made available under the Creative Commons Attribution-Non Commercial-Share Alike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/legalcode>).

Under the terms of this licence, this work may be copied, redistributed and adapted for non-commercial purposes, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that FAO endorses any specific organization, products or services. The use of the FAO logo is not permitted. If the work is adapted, then it must be licensed under the same or equivalent Creative Commons licence. If a translation of this work is created, it must include the following disclaimer along with the required citation: "This translation was not created by the Food and Agriculture Organization of the United Nations (FAO). FAO is not responsible for the content or accuracy of this translation. The original [Language] edition shall be the authoritative edition."

Disputes arising under the licence that cannot be settled amicably will be resolved by mediation and arbitration as described in Article 8 of the licence except as otherwise provided herein. The applicable mediation rules will be the mediation rules of the World Intellectual Property Organization <http://www.wipo.int/amc/en/mediation/rules> and any arbitration will be conducted in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law (UNCITRAL).

Third-party materials. Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

Sales, rights and licensing. FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org. Requests for commercial use should be submitted via: www.fao.org/contact-us/licence-request. Queries regarding rights and licensing should be submitted to: copyright@fao.org

PREPARATION OF THIS DOCUMENT

This report describes the activities and outputs of the FAO virtual workshop for Europe and Central Asia on “Development of a global information system for farmed types of aquatic genetic resources (incorporating a review of strategic priorities for a global plan of action)” held from 5-8 October, 2020. This document was prepared by Mr Graham Mair and Ms Daniela Lucente of FAO supported by Mr Joachim Carolsfeld and Mr Devin Bartley of the World Fisheries Trust (WFT) and Mr Dan Leskien and Ms Suzanne Redfern from the Commission on Genetic Resources for Food and Agriculture (Commission). The report was reviewed by participants in the workshop and their feedback incorporated prior to its finalization.

ABSTRACT

This report summarizes the proceedings and outcomes of the “Regional Workshop for Europe and Central Asia on the Development of a Global Information System for Farmed Types of Aquatic Genetic Resources (incorporating a review of strategic priorities for a Global Plan of Action)” held from 5 to 8 October 2020. The final wrap-up session was held on 15 October 2020.

This workshop, supported financially by the Government of Germany, was the fourth in a series of regional workshops held to generate feedback on the Registry of Farmed Types of Aquatic Genetic Resources (Registry) being developed by FAO in response to the findings of the first report on *The State of the World’s Aquatic Genetic Resources for Food and Agriculture* (SoW-AqGR) prepared under the guidance of the Commission on Genetic Resources for Food and Agriculture (Commission) and launched by FAO in 2019. As requested by the Commission, the workshop also sought feedback on an outline of a Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture (GPA), as requested by the Commission. The workshop was held online over a period of five days, with sessions lasting between 60 and 120 minutes.

The workshop was attended by National Focal Points for Aquatic Genetic Resources from Europe and Central Asia, officials from ministries, governmental organizations, research institutions and by representatives of regional aquaculture organizations. The objectives of the workshop were to promote standardized use of nomenclature and terminology in the description and categorization of aquatic genetic resources (AqGR), especially below the level of species (i.e. farmed types), to identify priority regional stakeholders who would benefit from and could contribute to an information system, such as the Registry, to evaluate the key elements of the prototype Registry using regionally relevant species and their farmed types and to review the strategic priorities and propose concrete activities under each of the four Priority Areas of the GPA.

Participants identified government resource managers, policy-makers, academia, researchers, and aquaculture producers as the principal stakeholders and beneficiaries of the Registry. These same stakeholders would also be the main contributors of information to the Registry. It was thus noted that special consideration needs to be given to engaging private industry and demonstrating the value of the Registry to the private sector. Participants made recommendations on the information sought for the Registry and, in particular, expressed concern over Members’ capacity to record information on production of farmed types of AqGR. Members also noted that angling associations would also be users of the information system.

Through a series of working group sessions, participants identified regionally relevant long-term goals for the four Priority Areas of the GPA, revised the list of strategic priorities of the GPA, and identified specific regionally relevant actions that should be taken under the different strategic priorities, and identified some potential indicators that may be used to monitor progress in the implementation of the GPA. This input will be considered in the preparation of the draft GPA.

CONTENTS

| | |
|--|-----|
| Preparation of this document..... | iii |
| Abstract | iv |
| Abbreviations and acronyms | vi |
| Opening of the workshop | 1 |
| Introduction and background..... | 1 |
| Workshop objectives | 2 |
| A registry of farmed types of Aquatic Genetic Resources as a key component of a Global Information System on Aquatic Genetic Resources for food and agriculture..... | 3 |
| A global plan of action for Aquatic Genetic Resources for food and agriculture | 4 |
| Registry of farmed types of Aquatic Genetic Resources..... | 5 |
| Classification of farmed types of Aquatic Genetic Resources | 6 |
| Clarifications and Suggestions | 7 |
| Review of the outline Global Plan of Action for Aquatic Genetic Resources for food and agriculture | 8 |
| Closing remarks..... | 9 |
| References | 9 |
| Annex 1 - Agenda for Europe and Central Asia Workshop..... | 11 |
| Annex 2 - List of participants..... | 13 |
| Annex 3 - Tentative Timeline for Development and Approval of a Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture (Note: all dates after June 2020 are considered tentative due to the disruption to schedules resulting from the COVID-19 pandemic.)..... | 17 |
| Annex 4 - Priority Areas of the Draft Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture: Long-term Goals, Strategic Priorities, Actions and Indicators..... | 18 |

ABBREVIATIONS AND ACRONYMS

| | |
|------------|---|
| AqGR | Aquatic genetic resources for food and agriculture |
| COFI | FAO Committee on Fisheries |
| Commission | FAO Commission on Genetic Resources for Food and Agriculture |
| CBD | Convention on Biological Diversity |
| DIAS | FAO Database on Introductions of Aquatic Species |
| FAO | Food and Agriculture Organization of the United Nations |
| GPA | Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture |
| ITWG-AqGR | Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture |
| NFIA | FAO Fisheries Division - Aquaculture Branch |
| NFI | FAO Fisheries Division |
| NFIS | Statistics and Information Branch |
| NFP | National focal point |
| Registry | Registry of Farmed Types of Aquatic Genetic Resources |
| SDG | Sustainable Development Goal |
| SoW-AqGR | <i>The State of the World's Aquatic Genetic Resources for Food and Agriculture</i> |

OPENING OF THE WORKSHOP

1. The “Regional Workshop for Europe and Central Asia on the Development of a Global Information System for Farmed Types of Aquatic Genetic Resources (incorporating a review of strategic priorities for a Global Plan of Action)” was held from 5 to 8 October 2020. A final wrap-up session was held on 15 October 2020. The agenda of the workshop is given in Annex 1.

2. The first session of the workshop (using a virtual webinar platform) was attended by 69 participants, made up of representatives from 21 Member Nations (including 16 national focal points [NFPs], officials from ministries and other relevant organizations) and three regional organizations. Attendance ranged from 50 to 56 over the remaining meeting sessions. The list of participants is provided in Annex 2.

3. Mr Audun Lem, Deputy Director of Fisheries Division (NFI) opened the meeting and welcomed all participants. He noted that the recent publication of the first report on *The State of the World’s Aquatic Genetic Resources for Food and Agriculture* (SoW-AqGR), launched by FAO in August 2019,¹ had been made possible by the 92 country reports. He mentioned that the SoW AqGR was well received as it highlights important issues related to the conservation, sustainable use and management of genetic resources in aquaculture. He further noted that the current information available on AqGR is incomplete and therefore the development of a Registry of farmed types of AqGR is a key step forward in addressing this limitation and is fundamental to the development of the Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture (GPA). He acknowledged the Government of Germany for the support of the development of the Registry and the GPA.

4. Ms Irene Hoffmann, Secretary of the Commission on Genetic Resources for Food and Agriculture (Commission), welcomed participants and provided some background on the work of the Commission and, more specifically, its activities related to aquatic genetic resources for food and agriculture (AqGR). She noted that the Commission, at its last session, had decided to establish the Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture (ITWG AqGR) as a regular working group of the Commission. She further recalled that the Commission had requested FAO to develop the GPA, in response to the SoW-AqGR. She further noted the importance of this and the other regional workshops as steps towards the draft GPA and expressed her gratitude to all participants for contributing to this process.

INTRODUCTION AND BACKGROUND

5. Mr Graham Mair, Senior Aquaculture Officer of the Aquaculture Branch (NFIA) of the Fisheries Division (NFI), presented an outline of the structure of the workshop and the mechanisms for interaction among participants. He then provided a brief overview of the scope of FAO’s past work before introducing the key findings of the SoW-AqGR and FAO’s initiatives to develop the Registry and prepare the GPA, as requested by the Commission. He then outlined the objectives and expected outputs of the workshop in relation to these two initiatives.

6. Through a poll, it was noted that 38 percent of the participants were heavily involved in the process of compiling the Country Reports for the SoW-AqGR, 14 percent had minor involvement, 41 percent had no involvement and 2 percent were not aware of the country reporting process.

¹ The report is available at <http://www.fao.org/3/CA5256EN/CA5256EN.pdf>; the *In Brief* of the report is available at <http://www.fao.org/3/CA5345EN/CA5345EN.pdf>

Workshop objectives

7. Mr Mair briefly explained that the workshop was being held to gather regional perspectives on the prototype Registry and on the priorities of the GPA outline. He noted that the specific objectives in relation to the Registry included:

- promoting standardized use of nomenclature and terminology in the description and categorization of AqGR, especially below the level of species (i.e. farmed types and stocks);
- identifying the priority stakeholders in the Registry; and
- identifying potential indicators for the effective monitoring of AqGR within a future GPA.

8. With regard to the GPA, Mr Mair noted that the review of the outline would address the following questions in the context of needs and challenges in AqGR management in Europe and Central Asia:

- What should be the long-term goals for each Priority Area?
- Is the list of Strategic Priorities within each Priority Area appropriate and inclusive for the region?
- Are there goals and specific actions that could be taken within the Strategic Priorities?
- What indicators could be used to monitor progress on the key elements of the GPA and how could these be integrated into the Registry or the broader global information system on AqGR?
- Are there recommendations on implementation and financing of the GPA on any of its elements?

9. Mr Jann Th. Martinsohn, Head of the Water and Marine Resources Unit, European Commission Joint Research Centre, Italy, presented an overview of how AqGR and, more generally, fisheries and aquaculture data, are managed within the European Union. He noted that although aquaculture is part of the EU's Blue Growth strategy, levels of aquaculture production in the EU were stagnant at approximately 1.3 million tonnes per annum. There was however, new interest in farming algae, but unlike elsewhere in the world, most of the production of macroalgae is currently harvested from the wild. He explained that the EU requires legally, through the Data Collection Framework, the EU Member States to collect wild capture fisheries and aquaculture data (biological, technical, socio-economic). This does not (yet) include genetic information, even though some Member States have started to include genetic data. Data are publicly accessible through the JRC/STECF Data Dissemination Tool, a public Bioeconomy Dashboard and, for genetic data related to Aquaculture, through Aquatrace, a Framework Project (FP7) investigating genetic characteristics of selected marine fish species to distinguish between wild fish and their farmed counterparts, to enable traceability and to monitor genetic introgression of farm escapees. He also mentioned the International Council for the Exploration of the Seas (ICES) Working Group on the Application of Genetics in Fisheries and Aquaculture (WGAGFA) which promotes the inclusion of genetics and evolutionary concepts and methods in management of fisheries and aquaculture.

10. Mr Gyula Kovács, Research Fellow of the Research Institute for Fisheries, Aquaculture and Irrigation (NAIK HAKI), Hungary presented an overview of freshwater aquaculture and AqGR in Central Asia and Eastern Europe. He noted that Uzbekistan leads Central Asia in aquaculture, primarily with introduced Chinese carps, sturgeon, trout and some other carnivorous species that are also farmed in smaller amounts. He noted that there is a need to improve data availability, capacity building, understanding and recognition of the threats of non-native species, fish health and identification and conservation of local farmed types. It was highlighted, however, that control of

hybridization is needed in this area. He further noted that, in Eastern Europe, aquaculture production is greater than that from capture fisheries, with the Russian Federation being the leading producer. He explained that there is a long history of common carp culture and selective breeding, with an established and published catalogue of ‘carp breeds’ in Central and Eastern Europe. He further noted that *ex situ* live gene banks for common carp have existed at HAKI in Szarvas, Hungary, since 1962, including genetic characterization and breeding programmes. Furthermore, sturgeon live gene banks were established in the 1980s for the use in conservation re-stocking programmes.

A registry of farmed types of Aquatic Genetic Resources as a key component of a Global Information System on Aquatic Genetic Resources for Food and Agriculture

11. Ms Daniela Lucente, Project Coordinator, NFIA, provided background information on the Registry. She noted that one of the major priorities identified in the SoW-AqGR was to *establish and strengthen a national and global characterization, monitoring and information system for AqGR*. This priority includes:

- a. promotion of a globally standardized use of terminology, nomenclature and descriptions of AqGR;
- b. improvement and harmonization of reporting procedures and expanded existing species-based information systems to cover unreported AqGR including ornamental species and micro-organisms; and
- c. development, promotion and commercialization/institutionalization of national, regional and global standardized information systems for the collection, validation, monitoring and reporting on AqGR² below the level of species (i.e. farmed types and stocks).

12. It was noted that examples of incorporating genetic diversity into national and global reporting and monitoring systems do exist, but primarily in the terrestrial agriculture sector, where nomenclature for breeds and varieties has been standardized and used for centuries (see, for example, the Domestic Animal Diversity Information System [DAD-IS]).³ It was noted that nothing similar exists for AqGR at global level.

13. It was recalled that the ITWG-AqGR, at its Second Session, had highlighted the critical need to *assess, explore and develop mechanisms to monitor the status and trends of AqGR through the establishment of a global information system and a Registry of farmed types of AqGR as well as stock of wild relatives, subject to the availability of the necessary funds*.⁴

14. The Government of Germany had responded by providing financial support to the development of the Registry. The projected outputs of the project funded by the German Government are:

- a functional prototype Registry populated with farmed types for a number of selected species;
- a website interface for the Registry for data entry and query;
- a series of regional workshops to build capacity and awareness and to validate the Registry; and
- a proposal for further development, institutionalization/commercialization and expansion of the Registry.

² It should be noted here that AqGR includes wild relatives of species that are cultured

³ <http://www.fao.org/dad-is/en/>

⁴ [CGRFA-17/19/8.1](#), paragraph 28.

15. Through another poll, it was noted that 47 percent of the participants often experience confusing uses of terms, 47 percent sometimes and 6 percent never confirming the related findings of the SoW-AqGR.

16. Mr Clemens Fieseler, Senior Officer, Federal Office for Agriculture and Food, Germany, presented the National Inventory on Aquatic Genetic Resources (AGRDEU),⁵ a reference database that maps the status of AqGR in Germany and provides standardized genetic information on the genetic diversity of AqGR. He noted that the database currently contains a list of 160 species, and provides information for each species on use, habitat and taxonomy. Furthermore, it was noted that AGRDEU delivers information on genetically characterized broodstock and wild fish stocks. It is envisaged to add *ex situ* information on AqGR conserved in gene banks in the medium term. More detailed information on the information system and access to the data is available from the on line AGRDEU information system.⁶ In the discussion, Mr. Fieseler clarified that the establishment of AGRDEU pre-dates the new terminology FAO will use for the global information system but has a number of common data fields.

17. Participants stressed the importance of conserving indigenous AqGR and the threat of non-native (alien) species, some of which are used in aquaculture. It was noted that genetic alteration of indigenous species being used in aquaculture can also present threats to wild relatives and therefore aquaculture facilities need to be managed to avoid escapes.

18. Participants noted that there is a need to standardize and harmonize terminology across the already existing information systems. Furthermore, participants noted that the environmental impacts of introduced farmed species in Central Asia is of great concern. In addition, participants noted that a native species selected through aquaculture could be as damaging or more damaging to the wild populations than introduced species. Mr Mair reiterated that the Registry will help evaluate this risk and the importance of controlling aquaculture escapees. Furthermore, he noted the structure of the Registry will enable users to record if the risks associated with a specific farmed type of a species differ from that associated with the species as a whole.

A Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture

19. Ms Suzanne Redfern, Technical Officer, Secretariat of the Commission, presented a brief history of the Commission as the only permanent intergovernmental body that specifically discusses and negotiates matters relevant to all components of biological diversity for food and agriculture. She highlighted the special features and themes of the GPAs and noted that previous GPAs in other agriculture sectors have helped governments to make policies, establish national strategies and priorities, direct research and secure funding for work on genetic resources for food and agriculture in these sectors.

20. It was recalled that the Commission, at its Seventeenth Regular Session held in February 2019, in response to the SoW-AqGR, had requested that FAO prepare a draft GPA for AqGR for consideration by the ITWG-AqGR and the Commission at their next sessions. It had also been agreed that the GPA should be prepared in consultation with the regions and in collaboration with the FAO Committee on Fisheries (COFI) and its relevant subsidiary bodies. The Commission had requested FAO to review the proposed objectives, overall structure and list of follow-up strategic priorities of the proposed GPA, as presented to the Commission.⁷ A full draft GPA, reflecting all comments and inputs received, will be

⁵ <https://agrdeu.genres.de/en/national-inventory-aqgr/>

⁶ *ibid*

⁷ <http://www.fao.org/3/my596en/my596en.pdf>

presented to the next sessions of the ITWG-AqGR and the Commission, for their consideration. Subsequently, the FAO Conference is expected to consider the GPA for adoption. The tentative timeline for the development of a GPA is outlined in Annex 3.

21. It was noted that the aquatic sector has no global information system nor a GPA and therefore is in a position to learn from the experiences of the other sectors. Mr Mair provided further background on the preparation of the GPA, explaining in detail the four Priority Areas that had been developed from the broad needs and challenges identified in the SoW-AqGR. He noted that one of the Priority Areas is specific to AqGR, namely Priority Area 2 with a focus on development of AqGR for aquaculture, which is in contrast to the GPAs in other sectors in which development of genetic resources has already happened over millennia. Mr Mair identified draft strategic priorities that have been indicated within each of the Priority Areas in response to specific needs and challenges in the SoW-AqGR.

22. It was further noted that the regional workshops are being used to provide feedback on both the Registry and the outline of the GPA as, in future, a functional and well-populated information system, of which the Registry will be a core component, will be an essential tool for the effective monitoring of the implementation of the GPA and other related instruments. Mr Mair noted that AqGR are often ignored in the consideration of genetic diversity in food and agriculture, for example in assessing indicators related to targets in Sustainable Development Goal 2.5 (maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species), in part due to the lack of indicators to quantify genetic diversity of AqGR.

REGISTRY OF FARMED TYPES OF AQUATIC GENETIC RESOURCES

Stakeholders in the Information System of Aquatic Genetic Resources

23. Mr Devin Bartley, Senior Research Associate, World Fisheries Trust, presented an overview of the primary stakeholders that could be users of and provide information to a Registry. Participants considered the role of primary stakeholders in the Registry, as identified during an expert workshop on the development of the Registry, that would be most interested in contributing to and/or using the Registry's information. Participants indicated through a poll that government resource managers and aquaculture producers would be the groups that would be the top two users of the Registry. This conclusion was supported by the results of an online survey that asked participants to score the relative importance of the different stakeholders in both contributing information to the Registry (Figure 1) and also in accessing and utilizing information from the Registry (Figure 2). This survey identified aquaculture producers, academia, researchers and government resource managers as the key providers of information to the Registry. The priority rankings were slightly modified for the proposed principal users/beneficiaries of the information in the Registry, being primarily government resource managers, policy makers and academia and researchers.

24. Participants stated that breeders would be important stakeholders in the Registry. Mr Mair clarified that although breeders and aquaculture producers are different, they were considered together in the aquaculture producer category of stakeholder.

25. Participants stressed the importance of angling associations and their stocking or restocking waterbodies for recreational fisheries in Europe and thus considered angling associations as important stakeholders in AqGR in the region. Hatcheries producing fish for angling usually do not produce farmed types specifically for angling (i.e. for release into natural and artificial waterbodies), but for general aquaculture production. Thus producing farmed types for angling may require different objectives from producing farmed types for grow-out in aquaculture. Participants further noted that angler awareness and education are needed for proper management of recreational fisheries. Mr Mair considered that the information currently included in the registry would already include information relevant to the needs of Angling Associations.

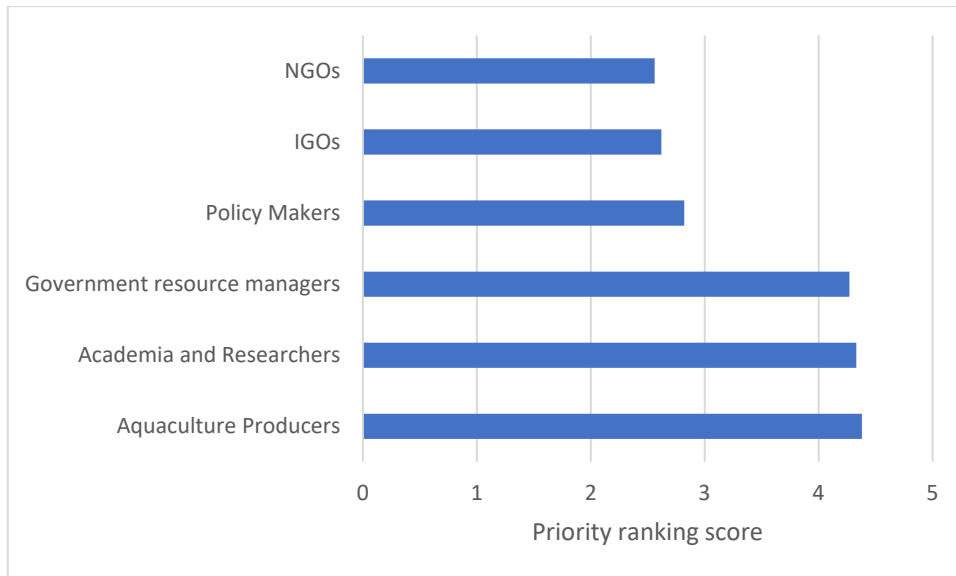


Figure 1: Summary of the scoring of participants (n=18) of the relative value of the Registry with regard to providing information to the Registry by primary stakeholders (participants were allowed to pick more than one stakeholder group as a main provider of information to the Registry).

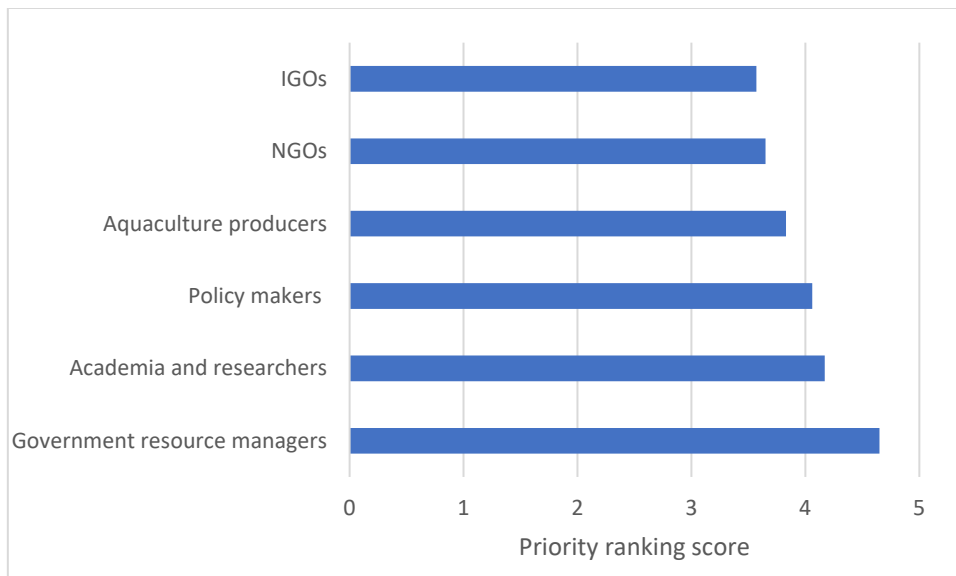


Figure 2: Summary of the scoring of participants (n=18) of the relative value of the Registry with regard to accessing and utilizing the system by primary stakeholders (participants were allowed to pick more than one stakeholder group as a main user of the Registry).

Classification of Farmed Types of Aquatic Genetic Resources

26. Mr Mair presented an overview of the classification system FAO is proposing for AqGR in the Registry. Participants considered the classification system for farmed types that was developed by FAO⁸ in consultation with an expert group and adopted in the Registry. The classification is based on two different categorizations; the “Primary” farmed types categorization refers to the level of domestication from the original wild-sourced farmed type. The “Secondary” farmed type categorization

⁸ <http://www.fao.org/3/ca8302en/CA8302EN.pdf#page=40>

refers to any of seven genetic improvement methodologies that can add value when applied to primary farmed types. Mr Mair noted that each species in an aquaculture facility will have one and only one primary farmed type, but it could have several or no secondary farmed types. He further noted that there should be a national focus on characterizing farmed types with these being categorized relative to other farmed types within the country (for example a strain can be defined as such if it is distinct from other farmed types of the same species, within the country).

27. Following the presentation on farmed types, 72 percent of respondents to a poll correctly classified a hypothetical primary farmed type. In a second poll, 59 percent were able to correctly classify secondary farmed types from a worked example.

28. Mr Mair gave a short demonstration of the utility of the user interface that enables data within the Registry to be queried, through a prototype user interface.⁹ He demonstrated the capacity to display, on the opening page, a summary of the global data entered into the system with the capacity to filter data by region, country, taxonomic category, species and primary and secondary farmed types. He showed how the data could also be summarized through pages specific to development of AqGR, sustainable use and conservation of AqGR, and AqGR Policies, Institutions and Capacity. Finally he demonstrated the capability to generate species and country fact sheets.

29. Ms Lucente gave an in-depth presentation on the user interface of the questionnaire that data providers will need to fill in to list farmed types in the Registry. She noted that in developing the questionnaire, a balance was sought between manageability and comprehensiveness: the system should be easy to handle and, at the same time, sufficiently comprehensive to be useful to a variety of stakeholders. It was mentioned that FAO has preloaded the interface with over 600 species from the Aquatic Sciences and Fisheries Information System (ASFIS). Ms Lucente further explained that the user interface has been field-tested in the Philippines, and proved useful in describing and cataloging several farmed types.

30. Through another poll it was noted that 83 percent of the participants believed that the information requested in the questionnaire was complete and appropriate for the region; the remaining 17 percent however, did not clarify what information was lacking.

Clarifications and Suggestions

31. Participants reviewed and discussed the utility of an information system and the elements and content of the proposed Registry including the questions on species and farmed types as listed in the guidelines provided to the participants as background reading, and summarized in Ms Lucente's presentation. It was emphasized that, in the first instance, entries to the Registry may be limited to commercial farmed types representing at least 10 percent of the national aquaculture production of the species in question (especially for captive propagated farmed types) and that farmed types used exclusively in research facilities and not in commercial production will not be included in the Registry. It was noted that these limitations are intended to control the size of the task of identifying farmed types where many exist.

32. However, it was also noted that, because the Registry is voluntary, a NFP can list any farmed type deemed important, irrespective of its contribution to commercial production of the species. The decision to endorse or sign off on entries into the Registry would ultimately be left to the NFP.

⁹ <https://fantonangeli.github.io/aqgr/home>. Note, this link is to an unpublished prototype interface, not for distribution. It may be necessary to copy and paste this link into a browser to view the user interface.

33. FAO explained that the species list preloaded in the Registry is based on the list of species of the ASFIS¹⁰ and includes the scientific name and a global common name used as the basis for identifying species to be entered into the system. However, the Registry list is more extensive than this, including species reported as farmed in the country reports prepared for the SoW-AqGR. Species common names in local languages will not be included in the preloaded species list.

34. It was noted that imported farmed types should be entered if they are commercially used, regardless of whether or not they are bred in the receiving country.

35. It was further noted that farmed types and AqGR can also include sterile organisms, e.g. triploids and some hybrids, which may be included in the Registry given that they are genetic resources that can be farmed even though, as sterile animals, they could not be used as broodstock to produce future generations.

36. The challenges of obtaining production data were recognized and it was noted that it would be the task of the NFP to estimate relative production for farmed types for which no production data were available.

37. It was also noted that currently there is no set schedule for updating the Registry, but that other sectors update their information systems regularly, e.g. DAD-IS. It was mentioned that a data validation system will be in place to ensure that data are checked and verified prior to being published in the Registry. Furthermore, it was noted that NFPs are free to update the Registry at any time. Participants also noted that a “time stamp” on information in the Registry would be important for users to understand how current the information is.

38. Mr Marc Taconet, Chief, Statistics and Information Branch of NFI, presented an overview of the already existing information sources maintained by FAO, in order for participants to understand how the Registry would fit within an overall system of information and knowledge products. Mr Taconet explained that as Members of FAO, countries have agreed to report to FAO a variety of statistics on fisheries and aquaculture. Key information sources included, *inter alia*, Species Fact Sheets, FishStatJ, ASFIS, Database on Introductions of Aquatic Species (DIAS) and Aquatic Sciences and Fisheries Abstracts (ASFA). The Registry would become another information source, based on voluntary contributions, within FAO and could be linked to many of these other databases.

REVIEW OF THE OUTLINE GLOBAL PLAN OF ACTION FOR AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE

39. The second part of the workshop focused on the draft outline of the GPA. Participants reviewed the four Priority Areas of the draft GPA, namely:

1. Establish and strengthen national and global characterization, monitoring and information systems for AqGR;
2. Accelerate appropriate development of AqGR for aquaculture;
3. Promote sustainable use and conservation of AqGR; and
4. Policies, institutions and capacity building.

40. In preparation for the break-out groups, FAO invited participants to: i) address whether the list of strategic priorities within each Priority Area is appropriate and inclusive for the region; ii) identify goals and specific actions that could be taken in the region within the strategic priorities; iii) identify indicators that could be used to monitor progress on the key elements of the GPA and how they

¹⁰ <http://www.fao.org/fishery/collection/asfis/en>

could be integrated into the information system; and iv) formulate recommendations on implementation of the GPA.

41. FAO informed participants that written comments on the strategic priorities, actions and indicators could be sent directly to FAO by email (ITWG-AqGR@fao.org) provided that this input was received prior to the commencement of the wrap up session on October 15, 2020.

42. Participants rotated through three break-out group sessions providing input into the Strategic Priorities and regionally relevant actions as per the objectives in paragraph 40. Annex 4 summarizes the outputs from these break-out group discussions for the four Priority Areas that will be considered in the preparation of the full draft GPA for AqGR.

CLOSING REMARKS

43. Mr Mair thanked all the participants for their attendance and active participation in the workshop, and gave a short review of the workshop outcomes.

44. Mr Mair outlined the next actions that FAO will take with regard to the Registry and the GPA and encouraged delegates to approach FAO if they wished to cooperate, in the near term, or longer term, with regard to entering data on species and farmed types for their country

45. Ms Irene Hoffmann, Secretary of the Commission, noted that the workshop had been very interesting and participants had engaged a lot in the discussion, noting some differences with discussions from other regions, and supported the focus on sustainable use and noted the inclusion of angling associations among the stakeholders. She also encouraged national focal points to engage and drive forward the sustainable use and conservation of AqGR at the national level through discussion on the European Green Deal. She further noted that the Commission is looking forward to the further development of the GPA and further discussions through the ITWG-AqGR.

46. Mr Auden Lem, Deputy Director the Fisheries Division, also congratulated participants on their active and strong engagement in the tasks of the workshop and the successful adaptation to the new format of the virtual workshop as a new way of working. He also acknowledged the task of the Division, together with the Commission to reconcile the inputs from all four regional workshops, in the development of a full draft GPA, and looked forward to bringing the conclusions of the workshop to COFI next year.

47. Mr Mair encouraged participants to continue their engagement with FAO on issues related to AqGR and again thanked all participants, organizers, interpreters, and closed the meeting.

REFERENCES

FAO. 2019a. *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. FAO Commission on Genetic Resources for Food and Agriculture assessments. Rome (available at <https://doi.org/10.4060/CA3129ENhttps://doi.org/10.4060/CA3129EN>).

FAO. 2019b. *The State of the World's Aquatic Genetic Resources for Food and Agriculture - In Brief*. FAO Commission on Genetic Resources for Food and Agriculture assessments. Rome (available at <http://www.fao.org/3/CA3229EN/CA3229EN.pdf>).

FAO. 2019c. *Options for Follow-up to the State of the World's Aquatic Genetic Resources for Food and Agriculture*. Rome (available at <http://www.fao.org/3/my596en/my596en.pdf>).

FAO. 2020. *The State of World Fisheries and Aquaculture 2020. Sustainability in action.* Rome (available at <http://www.fao.org/documents/card/en/c/ca9229en>).

Annex 1 - Agenda for Europe and Central Asia Workshop

| Session | Title | Objective | Key messages | Format | Advance reading |
|--|---|---|---|--|---|
| Day 1: Monday 05 October 14.30-16.00 CET | Introduction to the Registry | Raise awareness of key findings of the SoW-AqGR and rationale for the Registry | <ul style="list-style-type: none"> • The SoW-AqGR identified many needs and challenges • Lack of information on AqGR beyond species is a critical challenge • The value of the Registry to countries and the types of information it will contain | <ul style="list-style-type: none"> • Welcome remarks (<i>A. Lem, I. Hoffmann</i>) • Introduction to the workshop (<i>G.C. Mair</i>) • The SoW-AqGR: needs and challenges summary (<i>G.C. Mair</i>) • AqGR in the EU (Jann Martinsohn) • AqGR in Eastern Europe and Central Asia (Gyula Kovacs) • Why do we need a Registry? (<i>D. Lucente</i>) • AqGR information system for Germany (<i>C. Fieseler</i>) • Panel discussion | <ul style="list-style-type: none"> • Guidelines to virtual workshop • In Brief of the SoW-AqGR |
| Day 2: Tuesday 06 October 14.30-16.30 CET | Stakeholders and farmed types. Information content for the Registry. | <ul style="list-style-type: none"> • Facilitate understanding of members stakeholders that will use the information system and explain concept of farmed types • Seek feedback on the information content of the Registry | <ul style="list-style-type: none"> • Who will use the information system • The concept of farmed types and the relationship between species, primary and secondary farmed types • Are we collecting the correct information on species and farmed types? • Is there anything missing in the Registry? | <ul style="list-style-type: none"> • Stakeholders in the Registry (<i>D. Bartley</i>) • Discussion • What are farmed types? (<i>G.C. Mair</i>) • Health break • FAO information systems (<i>M. Taconet</i>) • Discussion • Data queries from the system (<i>G.C. Mair</i>) • Species level and farmed type data collection (<i>D. Lucente</i>) • Discussion | <ul style="list-style-type: none"> • Article: <i>What are Farmed Types and why do they matter?</i> • <i>Guidelines to the Survey Solutions Questionnaire on farmed types of aquatic genetic resources</i> |

| | | | | | |
|--|---|---|---|--|---|
| Day 3: Wednesday 07 October 14.30-16.30 CET | Introduction to the GPA-AqGR and first working group session | Understand the role of GPAs and the draft priorities for a GPA-AqGR | <ul style="list-style-type: none"> • What is the value of a GPA • What GPAs achieved in other sectors What is the structure of the GPA-AqGR | <ul style="list-style-type: none"> • Discussion on data collection (continued.....) • What is a GPA? (<i>S. Redfern</i>) • Discussion • The outline of the GPA-AqGR and introduction to working groups (<i>G. C. Mair</i>) • Discussion • Health break • Introduction to working group session • Working group session 1 | <ul style="list-style-type: none"> • Links to other GPAs • The outline GPA-AqGR |
| Day 4: Thursday 08 October 14.30-16:00 CET <i>Meeting format with breakout rooms</i> | Feedback on the GPA-AqGR and second and third working group session | Seek feedback from participants on regional priorities, actions and indicators for the GPA-AqGR | <ul style="list-style-type: none"> • Suggested changes to Priority Areas and strategic priorities • Possible actions on strategic priorities • Possible indicators | <ul style="list-style-type: none"> • Working group session 2 • Health break • Working group session 3 | <ul style="list-style-type: none"> • Links to other GPAs • The outline GPA-AqGR |
| Day 5: Thursday 15 October 14:30–15:30 CET | Wrap-up session with discussion on the final report | Present key outcomes of the workshop | <ul style="list-style-type: none"> • Key Feedback on Registry • Key suggested changes to Registry structure. • Summary of key changes to GPA-AqGR | <ul style="list-style-type: none"> • Presentation on Registry feedback (<i>G. C. Mair</i>) • Discussion • Presentation on GPA-AqGR development (<i>G. C. Mair</i>) • Discussion • Report adoption • What happens next? • Closing remarks (<i>I. Hoffmann and A. Lem</i>) | Workshop report |

Annex 2 - List of Participants

NATIONAL FOCAL POINTS

Mr Vladimir KOSTOUSOV
Deputy Director on Science,
Republican Daughter Unitary Enterprise
Fish Industry Institute
Belarus

Mr Constantinos MOUSTAKAS
Fisheries and Marine Research Officer
Fisheries and Marine Research
Ministry of Agriculture, Natural Resources
and Environment
Cyprus

Mr Martin FLAJSHANS
Professor, Doctor in Engineering
University of South Bohemia in Ceske
Budejovice
Faculty of Fisheries and Protection of Waters
Czechia

Mr Petri HEINIMAA
Principal Specialist
Natural Resources Institute Finland (Luke)
Production systems, Aquaculture solutions
Finland

Mr Nino LATSABIDZE
Head of the EU Integration Division in
Environmental Matters
European Integration Department
Ministry of Environmental Protection and
Agriculture
Georgia

Mr Clemens FIESELER
Federal Office for Agriculture and Food
Germany

Information and Coordination Centre for
Biological Diversity

Mr István LEHOCZKY
(alternate NFP)
Senior Research Fellow
National Centre for Biodiversity and Gene
Conservation
Hungary

Ms Ruta MEDNE
Head of Inland waters and fish restocking
Division
Fish Resources Research Department
Food Safety, Animal Health and Environment
Research Institute BIOR
Latvia

Ms Maria Dolores GAMBIN
Alternate National Focal Point
Chief Scientific Officer
Department of Fisheries and Aquaculture
Malta

Mr Alessandro ASTROZA
Advisor
Ministry of Industry, Trade and Fisheries
Norway

Mr Sipke Joost HIEMSTRA
Director, Centre for Genetic Resources,
Wageningen University & Research
The Netherlands

Mr Nikulin VIACHESLAV
Counsellor, Permanent Mission of the Russian
Federation to FAO and other UN Agencies in
Rome, Representative of the Federal Agency
for Fishery
Russian Federation

Mr Jan TOMKA
Deputy Head of the Department of Animal
Breeding and Product Quality, Research
Institute for Animal Production, National
Agricultural and Food Centre
Slovak Republic

Mr Andrea CALLEJO FERRERAS
Volunteer collaborator in the Permanent
Representation of Spain to FAO
Spain

Ms Frida SOLSTROM
Aquaculture Coordinator
Agriculture & Fisheries Development Unit
Swedish Board of Agriculture
Sweden

Mr İlhan AYDIN
National Focal Point - Deputy of Director
Associate Professor
Republic of Turkey Ministry of Agriculture
and Forestry, General Directorate of
Agricultural Research and Policies
Turkey

Ms Şirin FIRIDİN
Alternate National Focal Point
Head of Department of Breeding and Genetics
Central Fisheries Research Institute
Turkey

Mr Mahir KANYILMAZ
Alternate National Focal Point
Head of Department
General Directorate of Fisheries and
Aquaculture
Ministry of Aquaculture and Forestry
Turkey

**OBSERVERS AND OTHER
REPRESENTATIVES OF AQGR
STAKEHOLDERS**

BELGIUM

Mr Patrick SORGELLOOS
Belgium

EUROPEAN COMMISSION

Mr JANN TH. MARTINSOHN
Stakeholder
Head of Unit, Water and Marine Resources
European Commission

FRANCE

Mr Pierrick HAFFRAY
Responsable de la section aquacole SYSAAF/
INRAE
France

Soizic, SCHWARTZ,
Chargée de mission aquaculture,
ministère de l'agriculture et de l'alimentation
France

GEORGIA

Ms Irine LOMASHVILI
Senior specialist at the Department of
Biodiversity and Forestry of the Ministry
Georgia

GERMANY

Mr Bernhard FENEIS
President of the German Inland Fisheries
Association and Vice President of the
Federation of European Aquaculture
Producers (FEAP)
Germany

Ms Michaela HAVERKAMP
Federal Office for Agriculture and Food
Germany

Mr Klaus KOHLMANN
Leibniz Institute of Freshwater Ecology and
Inland Fisheries in Berlin
Germany

Mr Stefan SCHRÖDER
Head of the Information and Coordination
Centre for Biological Diversity
Germany

Mr Helmut WEDEKIND
Bavarian State Research Center for
Agriculture
Institute of Fisheries
Chair of Technical Committee on AqGR
Germany

HUNGARY

Mr Zsigmond JENEY
Hungary

Mr Gyula KOVACS
Genetic expert of HAKI
Hungary

IRELAND

Mr Tom F. CROSS
Emeritus Professor TF Cross DSc
School of Biology, Earth & Environmental
Sciences,
University College Cork, Ireland
Ireland

Mr Neil RUANE
Fisheries Ecosystems Advisory Services
Marine Institute
Ireland

LITHUANIA

Mrs Jolanta CESIULIENĖ
Chief specialist of the fisheries division
Lithuania

NORWAY

Ms Ingrid OLESEN
Senior scientist,
Nofima,
Norway

RUSSIAN FEDERATION

Mr Grigoriy GALSTYAN
Specialist of International Fisheries Law
Division, Russian Federal Research Institute
of Fisheries and Oceanography
Russian Federation

SLOVENIA

Mr Jernej BRAVNIČAR
Researcher at University of Ljubljana –
Biotechnical Faculty
Slovenia

TAJIKISTAN

Mr Akmal RADJABOV
Leading Specialist of the Department of Water
and Energy Policy, Science and Technology
Development
Tajikistan

THE NETHERLANDS

Mr Wout ABBINK
Centre for Genetic Resources
Wageningen University & Research
The Netherlands

Ms Kim VAN SEETERS
Senior policy officer
Ministry of Agriculture, Nature Food Quality
The Netherlands

TURKEY

Ms Derya ÖZÇELİK
Turkey

Mr Şakire Serap YILMAZ
Mediterranean Fisheries Research Production
and Training Institute Antalya/TURKEY
(MEDFRI)
Turkey

REGIONAL ORGANIZATIONS

Ms Paola DE SANTIS
Alliance Bioversity-CIAT

Ms Agnes FONTANEAU
Alliance Bioversity-CIAT

Mr Devra JARVIS
Coordinator Platform for Agrobiodiversity
Research Principal Scientist
Bioversity International
Italy

Mr Marc VANDEPUTTE
EAS Board member and Treasurer

Mr Péter LENGYEL
Network of Aquaculture Centres in Central
and Eastern-Europe (NACEE)
Budapest, Hungary

Ms Muhabbat TURDIEVA
Scientific research for Central Asia

FACILITATORS

Mr Devin BARTLEY
Facilitator
World Fisheries Trust

Mr Joachim CAROLSFELD
Facilitator
Executive Director
World Fisheries Trust

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Ms Ghislaine Zarah GILL
Associate Professional Officer
Commission on Genetic Resources for
Food and Agriculture (CGRFA)

Mr Matthias HALWART
Chief,
Aquaculture Branch
Fisheries Division

Ms Irene HOFFMANN
Secretary
Commission on Genetic Resources for
Food and Agriculture (CGRFA)

Mr Dan LESKIEN
Senior Liaison Officer
Commission on Genetic Resources
for Food and Agriculture (CGRFA)

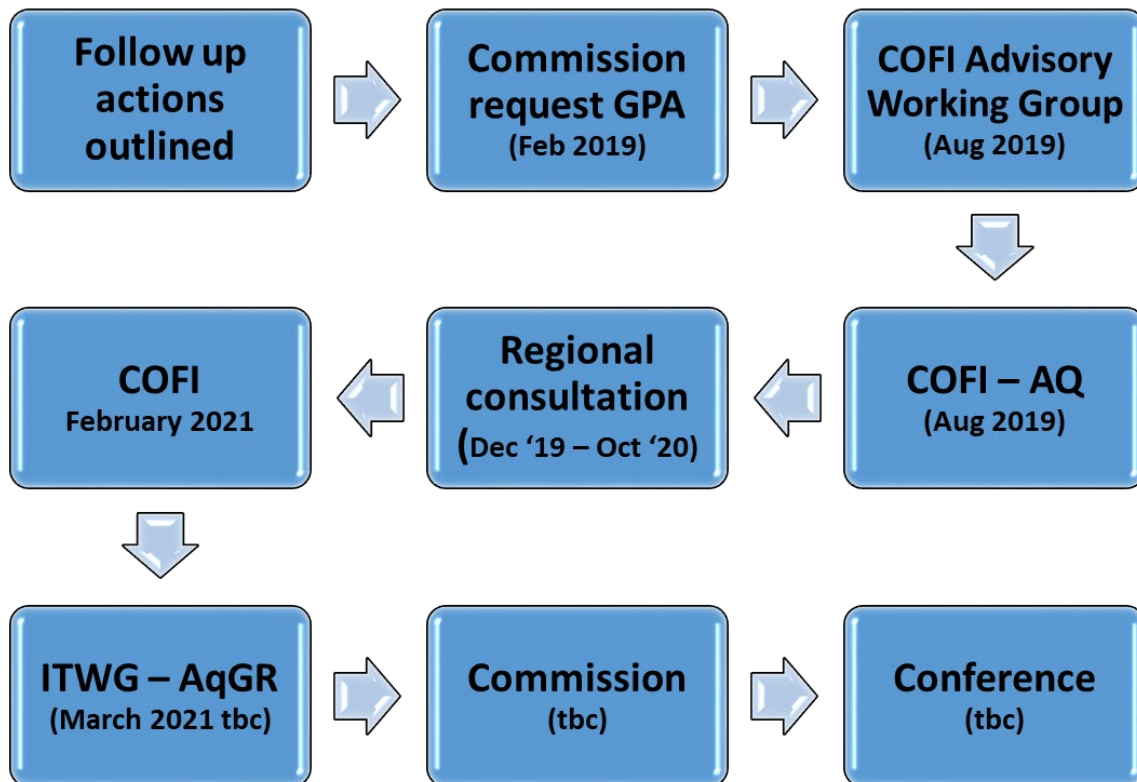
Mr Audun LEM
Deputy Director
Fisheries Division

Ms Daniela LUCENTE
Project Coordinator
Aquaculture Branch
Fisheries Division

Mr Graham MAIR
Senior Aquaculture Officer
Aquaculture Branch
Fisheries Division

Ms Suzanne REDFERN
Technical Officer
Commission on Genetic Resources
for Food and Agriculture (CGRFA)

Annex 3 - Tentative Timeline for Development and Approval of a Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture (Note: all dates after June 2020 are considered tentative due to the disruption to schedules resulting from the COVID-19 pandemic.)



Annex 4 - Priority Areas of the Draft Global Plan of Action for Aquatic Genetic Resources for Food and Agriculture: Long-term Goals, Strategic Priorities, Actions and Indicators
Working Group Sessions

The discussion focused, *inter alia*, on the following questions:

- What should be the long-term goals for the region for each Priority Area?
- Is the list of strategic priorities within each Priority Area appropriate and inclusive for the region?
- Can you identify goals and specific actions that could be taken in the region within the strategic priorities?
- What indicators can we use to monitor progress on the key elements of the GPA and how can these be integrated into the Registry or the broader Information system on AqGR.
- Do you have recommendations on implementation and financing of the GPA or any of its elements?

The following tables summarize the outputs under each of the Priority Areas in the outline GPA.

Priority Area 1: ESTABLISH AND STRENGTHEN NATIONAL AND GLOBAL CHARACTERIZATION, MONITORING AND INFORMATION SYSTEM FOR AQGR

Long-term goal: A detailed institutionalized global information system, utilizing standardized terminology, used by Members and stakeholders across the region

| Strategic priority | Actions |
|--|--|
| <p><u>Strategic Priority 1.1:</u> Promote the globally standardized use of terminology, nomenclature and descriptions of AqGR</p> <p><i>Indicator: Greater use of standardized terminology in aquaculture literature and media (standardised term search will need to be developed)</i></p> | <ul style="list-style-type: none"> • Develop a glossary of key terms for describing AqGR in national languages to make standardization easier; include examples of usages • Promote terminology usage in key aquaculture events (international, regional and national events) • Publish articles in aquaculture related media, including social media • Communicate initiatives to key European Commission, NGOs and other relevant regional bodies |
| <p><u>Strategic Priority 1.2:</u> Improve and harmonize reporting procedures and expand existing species-based information systems to cover unreported AqGR</p> <p><i>Indicator: number of countries which have national info systems on AqGR and number of countries utilizing the Registry for national reporting of AqGR (through survey, e.g. decadel SoW-AqGR)</i></p> <p><i>Note: ornamental fish and microorganisms not excluded completely but no need to emphasize.</i></p> | <ul style="list-style-type: none"> • Develop national legislation covering recording of resource use with special emphasis on the level below species • Communicate initiatives to key European Commission, NGOs and other regional relevant bodies |
| <p><u>Strategic Priority 1.3:</u> Develop, promote and 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).</p> <p><i>Indicator: Increased number of published articles</i></p> | <ul style="list-style-type: none"> • Promote and advertise the Registry for recording AqGR nationally • Identify donor support for further developing of the information system • Members request FAO to adopt long term maintenance of the FAO information system as part of its normative programme and maintain and regularly update the Registry • Promote Registry usage in key aquaculture events and in print media including articles and journals (international, regional and national) • Publish articles on the Registry in aquaculture related media, including social media |

Priority Area 2: ACCELERATE APPROPRIATE DEVELOPMENT OF AQGR FOR AQUACULTURE

Long-term goal: Impact of genetic improvement on production efficiency leading to increased aquaculture production in the region (e.g. better performance and resistance to diseases resulting from the breeding programs)

| Strategic priority | Actions |
|---|--|
| <p><u>Strategic Priority 2.1</u>: 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.</p> <p><i>Indicator: Number of successful awareness programmes for breeders, producers and consumers</i></p> | <ul style="list-style-type: none"> • Targeting awareness of breeders, producers, consumers (including the broader public), and authorities • Need for capacity building through online trainings and in general at knowledge centres including Universities • Development of consumer awareness programmes • Communicate benefits of development of public–private partnership for research and breeding • Developing consensus among scientists, breeders etc. on risks and benefits of genome editing and communicate key messages to all stakeholders in AqGR • Quantify and communicate potential economic benefits of the development of AqGR |
| <p><u>Strategic Priority 2.2</u>: Promote greater adoption of well-managed, long-term, selective breeding programmes as a core genetic improvement technology for all major aquaculture species.</p> <p><i>Indicator: number of breeding programmes for aquaculture species; proportion of aquaculture production met by improved Farmed Types (Using data from FAO Registry, decadel SoW-AqGR reports and scientific literature as sources of information)</i></p> | <ul style="list-style-type: none"> • Develop public–private partnerships for research and breeding • Support private companies and farmer associations in long-term breeding programmes and provide access to tools for information based management of broodstock (nationally, regionally, globally) • Support research on the potential risks associated with selective breeding, to enhance understanding on potential impacts on the environment of improved farmed types and to support the development of appropriate policies • Facilitate the development of guidelines on responsible use and exchange of AqGR, the use of genetic technologies and scientific research on technologies and promote exchange of technologies • Ensure the application of technologies on a regional basis and establish regional approaches and mechanisms and promote a network for the exchange of data and information among institutions responsible for AqGR for fisheries and aquaculture, development agencies and relevant international organizations |

| | |
|--|---|
| | <ul style="list-style-type: none"> • Consider potential development of sterile farmed animals for protection of intellectual property and the environment, where appropriate |
| <p><u>Strategic Priority 2.3:</u> Establish national and/or regional species and farmed types 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.</p> <p><i>Indicator: number of developed national and regional strategies; number of programmes proposing funding for development of AqGR</i></p> | <ul style="list-style-type: none"> • Develop incentives for investment in breeding programmes • Communicate opportunities and benefits of such strategies to funding agencies and programmes e.g. European Maritime and Fisheries Fund (EMFF) • Governments to support development of enabling environments to promote breeding programmes • Formation of national breeding lines with genetically improved production performance suitable for the production conditions of the countries. • Registration of the improvement lines developed • Development strategies should support and integrate breeding programmes with genebanks. |
| <p><u>Strategic Priority 2.4:</u> Conduct appropriate training and capacity building in genetic improvement, particularly in quantitative genetics.</p> <p><i>Indicator: Increase in number of courses and educated people (e.g. through SoW-AqGR data on training institutions)</i></p> | <ul style="list-style-type: none"> • Recognise and respond to need for capacity building (e.g. through online, hands-on trainings and joint curricula) and in general at knowledge centres • Ensure that capacity building is appropriate to future needs of the sector (e.g. through industry consultation) • Providing comprehensive training for commercial farm owners and technical personnel participating in the breeding program on breeding methods, establishing breeding stock, branding/marketing tagging of breeders and offspring, evaluation of production performances, recording, isolation, sanitation etc. |

Priority Area 3: PROMOTE SUSTAINABLE USE AND CONSERVATION OF AQGR

Long-term goal: AqGR, including native and non-native species native and non-native farmed types, are sustainably used and conserved for the benefit of aquaculture, culture based fisheries, and commercial and recreational fisheries

| Strategic priority | Actions |
|--|---|
| <p><u>Strategic Priority 3.1:</u> Develop risk-based policies and controls on introductions and transfers of AqGR and implement monitoring systems to understand the impacts of non-native species (including farmed types of native species) in order to optimize benefits and reduce their negative impacts on both farmed and wild relative AqGR</p> <p><i>Goal: Establish appropriate risk based policies and monitoring systems to evaluate and/or minimize negative impacts due to introductions and transfers while optimizing benefits</i></p> <p><i>Indicator: None provided</i></p> | <ul style="list-style-type: none"> • Identify risks of stocking of native over non-native farmed types • Identify diseases and disease prone areas • Refer to and follow EU Directives on introduction of new species and on disease and adapt to other regions. • Address risk of farmed types of native species, especially domesticated and improved farmed types • Manage fish predators, e.g. otters and birds, in water bodies • Stock genetically appropriate native farmed types¹¹ |
| <p><u>Strategic Priority 3. Xx:</u> Develop risk-based policies and controls on introductions and transfers of AqGR and implement monitoring systems to understand the impacts of farmed types of native species in order to optimize benefits and reduce their negative impacts on both farmed and wild relative AqGR</p> <p><i>Goal: Protect native wild resources</i></p> <p><i>Indicator: None provided</i></p> <p><i>Note: 3.Xx could be merged with 3.1</i></p> | <ul style="list-style-type: none"> • Assess risk and minimize impact of restocking with genetically altered broodstock for natural water bodies • Characterize wild resources to evaluate impact • Use sterile farmed types on farms and in restocking programmes • Promote use of wild sourced native species as broodstock for juvenile rearing and restocking/stock enhancement. |
| <p><u>Strategic Priority 3. Xx (New):</u> Sustainable use and development of existing farmed types in aquaculture (development of new farmed types under SP Area 2)</p> | <ul style="list-style-type: none"> • Manage broodstock • Manage hatcheries • Develop good breeding programmes • Manage ¹²for pathogen resistance and other environmental conditions, e.g. salinity tolerance • Develop registries of farmed types • Identify markers for selection and to identify farmed types |

¹¹ Note made during wrap up session by Ingrid Olesen: Stock genetically appropriate native farmed types, for example those that have been selected/adapted to the relevant farm environment

¹² Note made during wrap up session by Ingrid Olesen: “Manage and breed for pathogen resistance.....”

| | |
|---|--|
| | <ul style="list-style-type: none"> • Track/monitor farmed types and products • Monitor genetic variability and inbreeding in farmed types and wild relatives • Domestication of new species and effective monitoring, genetic management and genetic improvement of species that are already produced commercially |
| <p><u>Strategic Priority 3.2:</u> Identify native and non-native wild relatives of AqGR most at risk to ensure that they are managed sustainably and appropriate conservation measures are implemented where necessary</p> <p><u>Goal:</u> None provided</p> <p><u>Indicator:</u> None provided</p> | <ul style="list-style-type: none"> • Restock at-risk stocks using conservation breeding, especially native stocks, and both commercial and recreational fisheries stocks • Improve efficiency of restocking efforts taking into account ecological conditions, and impact on biodiversity • Support collaboration among restocking plans at regional scale • Rehabilitate habitats for restocking and/or fishery management for conservation • Stock with genetically appropriate farmed types • Raise awareness of stakeholders (ie: anglers associations in Hungary, breeders) on the native wild relatives most at risk and promote them to manage these stocks sustainably |
| <p><u>Strategic Priority 3.3:</u> Monitor and anticipate the current and future impacts of environmental change on AqGR and respond accordingly</p> <p><u>Goal:</u> None provided</p> <p><u>Indicator:</u> Reports on impacts of climate change and number of genetics based adaptation approaches adopted.</p> | <ul style="list-style-type: none"> • Get support to identify positive and negative impacts of climate change • Look at regional differences in impacts of climate change • Develop breeding programmes to anticipate impact of environmental change • Compile information on genetic basis for resilience and adaptation to changing environment • Create mathematical models to anticipate impacts of climate change |
| <p><u>Strategic Priority 3.4</u>¹³ Identify threatened wild relatives of AqGR that are critical to aquaculture development and to wild capture fisheries and to prioritize these for <i>in situ</i> conservation (combine add 3.6 here)</p> <p><u>Goal:</u> None provided</p> <p><u>Indicator:</u> None provided</p> | <ul style="list-style-type: none"> • Engage other sectors and multi-stakeholders to establish <i>in situ</i> conservation and protected areas. • Expand protected areas because at present they are insufficient • Monitor and ensure effectiveness of protected areas • Identify global sources of AqGR that are valuable for the region • Link Registry with EU efforts/directives on protected areas and maps. • Address the underlying knowledge, resource and policy-related constraints to the establishment of |

¹³ The previous Priority 3.4 in the outline GPA was combined with Priority 3.2

| | |
|---|--|
| | effective conservation programmes for biodiversity |
| <p><u>Strategic Priority 3.5:</u> Actively incorporate conservation of AqGR in the development of fisheries management plans, particularly for threatened species</p> <p><u>Goal:</u> <i>None provided</i></p> <p><u>Indicator:</u> <i>None provided</i></p> | <ul style="list-style-type: none"> • Assess genetic variability and real stock size • Identify fish stocks for commercial development • Identify cryptic types and species • Develop fishery management through genetic identification of commercial stocks • Evaluate introgression between introduced and native farmed types • Improve traceability of fish and fish products • Improve conservation of commercial fish stocks • Identify non-native species • Identify species and/or stocks that can rebuild fish stocks and be stocked • Evaluate inbreeding in wild relatives • Conserve fish stocks |
| <p><u>Strategic Priority 3.6:</u> Aquatic protected areas should be considered in the development of <i>in situ</i> conservation of key AqGR (also under 3.4 to merge)</p> <p><u>Goal:</u> <i>None provided</i></p> <p><u>Indicator:</u> <i>None provided</i></p> | Combined with 3.4 |
| <p><u>Strategic Priority 3.7:</u> Identify the priority threatened and important AqGR as candidates for effective <i>ex situ</i> conservation in cases where they can supplement breeding programmes and restocking programmes, and where <i>in situ</i> conservation has not worked or is impractical</p> <p><u>Goal:</u> <i>None provided</i></p> <p><u>Indicator:</u> <i>None provided</i></p> | <ul style="list-style-type: none"> • Support creation, development and maintenance of national and regional <i>in vivo</i> and <i>in vitro</i> gene banks • Support networking of existing gene banks within regions and globally • Identify threatened species and organize breeding programmes and associated infrastructure for both live and frozen gene banks • Start <i>ex situ</i> and <i>in situ</i> together at same time • Monitor <i>in situ</i> conservation programmes/actions |

| | |
|---|---|
| <p><u>Strategic Priority 3.8:</u> Include non-food AqGR, such as ornamental species, alongside that of food fish, and identify related risks and needs, especially in regard to invasive species</p> <p><u>Goal:</u> None provided <u>Indicator:</u> None provided</p> | <ul style="list-style-type: none"> • Reinforce existing regulations on movement of AqGR in regards to recreational fishing which may be a non-food AqGR |
| <p><u>Strategic Priority 3.9:</u> Develop Best Practices for the use and exchange of AqGR and genetic technologies including transgenic and gene edited secondary farmed types under national and international legal instruments</p> <p><u>Goal:</u> None provided <u>Indicator:</u> None provided</p> | <ul style="list-style-type: none"> • Reinforce existing legislation on the use of genetic technologies. • Use a precautionary approach to new genetic technologies, noting there are not many problems with traditional genetic technologies, e.g. selection, hybridization. • Establish registries and control for improved farmed types • Conduct strain testing and monitoring to maintain distinguishing character of strain • Understand private breeding practices and liaise with breeding industry |
| <p><u>Strategic Priority 3.10:</u> Increase public awareness and communication on risks and benefits of new genetic technologies, e.g. transgenic and gene edited farmed types, on AqGR development</p> <p><u>Goal:</u> None provided <u>Indicator:</u> None provided</p> | <ul style="list-style-type: none"> • Make short films and publications for distribution at trade shows, meetings and other venues. • Write articles for European Aquaculture and other relevant publications • Engage and intensively use social media directed to aquaculture and fishery stakeholders |

Priority Area 4: POLICIES, INSTITUTIONS AND CAPACITY BUILDING

Long-term goals:

Sustainable and efficient policy implementation on AqGR taking into consideration environmental and industry developments.

Capacity building increased on AqGR, including human capacity

| Strategic priority | Actions |
|---|--|
| <p><u>Strategic Priority 4.1:</u> 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.</p> <p><i>Indicator: Training courses developed; number of national strategies developed.</i></p> | <ul style="list-style-type: none"> • Establishment of training courses, including good practice examples • Raising awareness for policy-makers on AqGR in general • Increase EU cooperation on AqGR |
| <p><u>Strategic Priority 4.2:</u> Develop national strategies for <i>in situ</i> and <i>ex situ</i> conservation and development of AqGR and their sustainable use.</p> <p><i>Indicator: Number of national strategies developed.</i></p> | <ul style="list-style-type: none"> • Multi-stakeholder private/public consultations • Establishment, development and networking of private/public cryobanks/genebanks at national and regional level to support the conservation and sustainable use of AqGR |
| <p><u>Strategic Priority 4.3:</u> Support improved national and regional communication on AqGR and raise awareness of the importance of AqGR among stakeholders including the industry, consumers and policy-makers.</p> <p><i>Indicator: Number of promotional material developed.</i></p> | <ul style="list-style-type: none"> • Include the good practices and management of AqGR in already existing or future systems of recognition, codes of conduct and/or official labelling • Development and dissemination of promotional material to be used at key aquaculture events |
| <p><u>Strategic Priority 4.4:</u> 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.</p> <p><i>Indicator: Number of promotional material produced.</i></p> | <ul style="list-style-type: none"> • Inclusion of information in already existing official surveys into already existing national programmes on AqGR • Development and promotion of material, also into local languages, to raise awareness on AqGR • Collection and promotion of local knowledge on AqGR |
| <p><u>Strategic Priority 4.5:</u> Support reviews of national legislation governing non-native AqGR including responsible use and</p> | <ul style="list-style-type: none"> • Development of national legislations in compliance with international agreements [EU regulation 708/2007] |

| | |
|---|--|
| <p>exchange based on appropriate assessments of risks and access and benefit-sharing specific to properties of AqGR.</p> <p><i>Indicator: Number of national legislations established.</i></p> | <ul style="list-style-type: none"> • Assess compatibility of the science-based risk assessment processes in AqGR with current regulations • Improve control systems in the international traceability to include farmed types as well as species |
| <p><u>Strategic Priority 4.6:</u> 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.</p> <p><i>Indicator: Number of projects developed.</i></p> | <ul style="list-style-type: none"> • Development of international pilot projects (e.g. conservation and breeding) and their results shared with other regions • Development of multi-disciplinary projects across countries and regions • Increase capacity building on conservation, sustainable use and breeding |
| <p><u>Strategic Priority 4.7:</u> Establish or strengthen national institutions, including national focal points, for planning and implementing AqGR measures, for aquaculture and fishery sector development.</p> <p><i>Indicator: Number of meetings held; number of national strategies developed.</i></p> | <ul style="list-style-type: none"> • Involve NFP in the development of national strategies on AqGR and research calls • Develop virtual meetings to strengthen national institutions on AqGR |
| <p><u>Strategic Priority 4.8:</u> Establish or strengthen national institutions for education and research on AqGR and promote intersectoral collaboration on their conservation, sustainable use and development.</p> <p><i>Indicator: Number of curricula courses developed; number of graduates.</i></p> | <ul style="list-style-type: none"> • Involve AqGR research and education institutions in the roadmap of European research centres • Increase recognition on creation of new AqGR by domestication • Support the establishment, development and maintenance of genebanks • Increase the role of citizen scientists at national level • Establishment of national and international courses on specific topics on AqGR, including the use of international research networks • Recommend that higher education institutions in fish industry and veterinary studies consider including a certain number of curriculum hours specifically on AqGR |
| <p><u>Strategic Priority 4.9:</u> Strengthen national human capacity for characterization, inventory, and monitoring of trends and associated risks, for conservation, sustainable use and development of AqGR including</p> | <ul style="list-style-type: none"> • Development of manuals, guidelines and online training programmes • Reinforcement of programmes at higher education level in order to ensure preparedness |

| | |
|---|---|
| <p>economic valuation, characterization, and genetic improvement.</p> <p><i>Indicator: Nnumber of manuals and guidelines, increased participation in online training programmes.</i></p> | <ul style="list-style-type: none"> • Improve data collection and dissemination • Development of tools and methodology for data collection and analysis, information management systems, and methods of adoption and distribution. |
| <p>Strategic Priority 4.10: Encourage the establishment of network activities and support the development and reinforcement of international networking and information sharing on AqGR.</p> <p><i>Indicator: Number of networks established with increased participation.</i></p> | <ul style="list-style-type: none"> • Strengthen the inclusion and promote collaboration of existing networks through programmes such as cost-action |
| <p>Strategic Priority 4.11: Strengthen efforts to mobilize resources, including financial resources for the conservation, sustainable use and development of AqGR.</p> <p><i>Indicator: Number of realized projects in field of AqGR</i></p> | <ul style="list-style-type: none"> • Increase EU funding on AqGR research and conservation (for example LIFE and/or EMFF) |

In October 2020, the Food and Agriculture Organization of the United Nations (FAO) held a virtual regional workshop for Europe and Central Asia on the “*Development of a global information system for farmed types of aquatic genetic resources (incorporating a review of strategic priorities for a global plan of action)*”. The workshop aimed at promoting a standardized use of nomenclature and terminology in the descriptions and categorization of farmed types of aquatic genetic resources (AqGR), and seeking feedback from Members Europe and Central Asia on the development of an FAO-hosted information system on farmed types and on the outline of a Global Plan of Action for AqGR.

ISBN 978-92-5-133689-2 ISSN 2070-6987



9 789251 336892

CB2359EN/1/01.21