



Sixth Session of the Central Asian and Caucasus Regional Fisheries and Aquaculture Commission (CACFish)
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MAIN FINDINGS AND RECOMMENDATIONS FROM ACTIVITIES ON AQUATIC GENETIC RESOURCES

BACKGROUND

1. Aquatic genetic resources (AqGR) underpin the productivity and sustainability of world aquaculture and capture fisheries, and the essential services provided by aquatic ecosystems in marine, brackish and freshwaters. Aquaculture currently plays and will continue to play an important role in meeting the needs for fish and fish products of an ever-increasing human population. The use and exchange of aquatic genetic resources have been crucial elements in helping aquaculture to become the fastest growing food producing sector, although it has been estimated that less than 9% of the current aquatic species being farmed have been the subject of formal genetic improvement programs.

2. Today, aquaculture accounts for nearly half of all fish consumed and the proportionate contribution is expected to increase to meet future needs. Improvements in aquaculture technology, aquatic animal health, aquatic biosecurity, animal husbandry, nutrition, larval rearing, genetics and breeding have led to a great diversity of farmed aquatic animals. More aquatic species are being farmed today than ever before, for example, in 1950 there were globally 72 species farmed from 34 families. By 2013, countries reported nearly 575 species farmed from over 115 families.

3. This document provides main decisions and recommendations from two recent FAO activities on Aquatic Genetic Resources (AqGR). The first activity was a regional expert meeting on Conservation and Management of Fish Genetic Resources organized by the CACFish Secretariat in Trabzon, Turkey, May 2017. At the global level, FAO was tasked by the Commission on Genetic Resources with producing a report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. This work is in progress and has relied on 28 country responses, including countries from the REU region.

I. REGIONAL EXPERT MEETING ON CONSERVATION AND MANAGEMENT OF FISH GENETIC RESOURCES

4. A regional expert meeting on conservation and management of fish genetic resources was organized by the CACFish Secretariat in Trabzon, Turkey, May 2017. The expert meeting was attended by forty participants from nine countries: Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan. After providing a brief description of the global status of aquatic genetic resources, the expert meeting concentrated on the status of such resources in Central Asian and Caucasus (CAC) countries. This activity falls within the Second Regional Work Programme (RWP2) of the Commission. The Meeting discussed the contribution of CAC countries to global reports on AqGR, such as *The State of the World's Aquatic Genetic Resources for Food and Agriculture (Section III)*, for which Armenia, Georgia, Kazakhstan, Kyrgyzstan, Turkey and Uzbekistan submitted national reports on aquatic genetic resources and information on the state and management of farmed aquatic species and their wild relatives under national jurisdiction.

5. Most important findings of the expert meeting were:

- Conservation of Aquatic Genetic Resources (AqGR) has not been a priority issue in the region.
- Studies on fish stocks are undertaken on a regular basis in certain CAC countries. Studies need to be adopted in other countries in CAC.
- There is special conservation attention on certain high value fish species, such as sturgeon and carp.
- Specific and long-term national programs are needed for genetic rebuilding of fish stocks; restoration of ecosystems and habitats; selective breeding programs and gene banks.
- Limited progress has been achieved in genetic improvement, genetic stock identification and genomics of aquatic species by molecular identification techniques in the region.
- The CAC region has a long tradition of stock enhancement through hatchery-rearing.
- Ecosystem Approach to Fisheries (EAF)¹ can be considered as a tool for conservation and sustainable management of fisheries in the region.
- Most of the wild relatives of farmed aquatic species still exist and need conservation and management of their natural status.
- Maximum Sustainable Yield (MSY) has been a principal biologic reference point in the management of fisheries.
- There is a need for clear objectives of conservation and management of Aquatic genetic resources.

6. Main **challenges** identified in the region:

- Insufficient information and data on the current conservation status of AqGR.
- Insufficient monitoring, research and assessment on the status of fish species, ecosystems and habitats.
- Insufficient inland fisheries research and management in the landlocked countries.
- Insufficient effective instruments for the protection and conservation of the AqGr.

¹ FAO Guidelines on the Ecosystem Approach to Fisheries, Rome 2003.

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- Insufficient financial resources.
 - Insufficient human resources, infrastructure and technology.
 - Increasing habitat destructions (hydropower plants, urbanization, pollution).
 - Climate change.
 - Competition for water.
 - Insufficient knowledge on genetics of more commercially important fish species.

7. Main **recommendations** for CAC region:

- Harmonization of terminology.
- Harmonization of protocols/methods in the region.
- Promotion of modern biotechnology methods, by carefully considering associated risks.
- Promotion of stakeholder involvement and public awareness in the conservation of AqGR.
- Promotion of EAF, precautionary approach, and science-based fisheries management.
- A regional workshop on the status of International Union for Conservation of Nature (IUCN) red list of threatened fish species in the region and on associated reporting procedures.
- Address management and conservation objectives, biologic and ecologic reference points.
- Development of national and regional programs to restore fish genetic resources through technical assistance from CACFish.
- Establishment of a working group on fish genetic resources, to work with CACFish

8. Suggestions for **actions** and **research priorities** for the region:

- Priority research areas: biodiversity assessment, aquaculture species, gene bank, developing genetic markers, Short Tandem Repeats (STRs) microsatellite, Single Nucleotide Polymorphisms (SNPs), identification of a software for accurate parentage assignments.
- Other priority areas: training, capacity building, networking, data exchange, exchange of genetic material, joint research, exchange of researchers.
- Development of a genetic base guideline for broodstock management of important fish species and genetic resources (importance of environment and commercial species) in CAC region.
- Joint research using advanced knowledge and technology for the conservation and management of AqGR, namely artificial reproduction, population genetics, genetic tools, cryopreservation, live gene bank, tissue culture, and DNA barcoding.
- More management consolidation on the protection of species, also including habitat restoration.
- Preparation of a check-list of fish species from CAC region and creation of a reference database by using DNA barcoding of fish species.
- Promotion of a strong collaboration on the management and conservation of AqGR among active regional organizations, such as CACFish Members and universities.
- Exploring ways of collaboration with the FAO Technical Working Group on Aquatic Genetic Resources.

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

9. As an advisory body to the FAO Commission on Genetic Resources for Food and Agriculture, the Ad Hoc Intergovernmental Technical Working Group (WG AqGR) on Aquatic Genetic Resources for Food and Agriculture² convened its Second Session on 23-25 April 2018 in Rome, Italy. The WG AqGR reviewed the revised a draft Report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture (AqGR Report)* that will provide a comprehensive global assessment of the status, use and exchange, drivers and trends, conservation efforts, stakeholders, policies and legislation, research, education, training and extension, and international collaboration relevant to AqGR. The AqGR Report is a first and important step towards analyzing gaps in reporting aquaculture and fisheries data to FAO in a coherent and consistent manner, and in the identification of knowledge gaps regarding aquatic genetic variation below the level of species.

10. The WG AqGR was established to guide the preparation and review of the AqGR Report and is composed of 28 Member Nations from the following regions: 5 from Africa, **5 from Europe**, **5 from Asia**, 5 from Latin America and the Caribbean, 4 from the Near East; 2 from North America, 2 from the Southwest Pacific. 92 officially endorsed country reports were received by the WG AqGR, including the 11 top aquaculture-producing countries. In addition to country reports, selected materials from thematic background studies were incorporated into relevant sections of the draft AqGR Report.

11. The WG AqGR proposed a series of recommendations for the revision of the AqGR Report, namely:

- Include specific country examples where relevant.
- Provide an analysis by developing vs developed countries.
- Provide examples of new species and farmed types.
- Use additional information (e.g. from the scientific literature) to complement country reports.
- Harmonize definitions, clarify some of the concepts mentioned.
- Provide an in-depth analysis of findings, including inter alia on climate change, habitat change and invasive species as drivers impacting AqGR.
- Include some specific examples of successful AqGR ex situ and in situ conservation programmes and strategies, and stress the complementarity of the two conservation approaches.
- Demonstrate the close linkages between aquaculture and capture fisheries systems that depend on wild AqGR.
- Include an analysis of how effectively the various networks contribute to the sustainable use and conservation of AqGR.
- Highlight key findings and gaps that will require a policy response to improve the sustainable use and conservation of AqGR.

² Ad Hoc Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture webpage: <http://www.fao.org/aquatic-genetic-resources/working-groups/itwg/en/>

12. The publication of the AqGR Report in 2018 will provide an opportunity for countries and relevant stakeholders to define strategic priorities with the aim to enhance the contribution of AqGR to food security and rural development. The AqGR Report will give 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 these resources. It further documents that for most farmed aquatic species, production is expected to increase over the next ten years. Appropriate practices, e.g. selective breeding, may help and, in fact, are urgently needed to meet this expectation in a sustainable manner and therefore deserve greater attention.