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**REGIONAL CONSULTATION FOR EASTERN EUROPE AND  
CENTRAL ASIA ON THE DEVELOPMENT OF GUIDELINES FOR  
SUSTAINABLE AQUACULTURE (GSA)**

**Virtual meeting, 29–31 March 2021**



Report of the  
REGIONAL CONSULTATION FOR EASTERN EUROPE AND CENTRAL ASIA ON THE DEVELOPMENT  
OF GUIDELINES FOR SUSTAINABLE AQUACULTURE (GSA)

Virtual meeting, 29–31 March 2021

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## **PREPARATION OF THIS DOCUMENT**

This document provides a summary of the presentations, discussions, conclusions and recommendations of the Regional Consultation for Eastern Europe and Central Asia on the development of Guidelines for Sustainable Aquaculture (GSA) held from 29 to 31 March 2021 using the Zoom Platform. The consultation was prepared and coordinated by the GSA Secretariat of the FAO Fisheries and Aquaculture Division.

## ABSTRACT

The Regional Consultation for Eastern Europe and Central Asia on the Development of Guidelines for Sustainable Aquaculture (GSA) was held as a virtual meeting from 29 to 31 March 2021. Of the 39 delegates who attended the meeting 33 were government representatives; others were representatives of the Eastern Europe and Central Asia, and Caucasus Regional Fisheries and Aquaculture Commission (CACFish) and the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC). A list of delegates is presented in Annex 1.

The objectives of the regional consultation were as follows:

- share current policies and practices related to aquaculture in the region;
- review existing regional and national sustainable aquaculture instruments;
- develop a list of priority thematic modules, considering regional and national strengths and challenges;
- propose and prioritize possible case study concepts linked to one or more thematic modules;
- identify regional priority areas to be included in the GSA.

All countries in the region recognize the need for aquaculture governance systems, and to varying degrees, they have developed policy, legislative, regulatory, and implementation mechanisms to support sectoral growth. Across the two sub-regions (Eastern Europe and Central Asia) there are significant differences in the complexity of the governance frameworks, structures and systems. Of particular concern is the lack of institutional capacity and resources available to develop and implement governance frameworks in some of the Central Asian countries.

Forty three of the 75 GSA thematic modules proposed by the Expert Consultation (Rome 2019) were identified as priority areas for further GSA development. There was some regional variation in the thematic modules that were prioritized by the two sub-regions. Of the 43 prioritized thematic modules, 27 (62 percent) were identified as common to both sub-regions, with the remaining 16 thematic modules being identified as important to one sub-region, but not the other.

The delegates concluded that 25 of the 26 case studies proposed by the Expert Consultation (June 2019) and approved by the COFI-SCA held in Trondheim (August 2019) were relevant to the region. The one case study that was deemed not relevant to the region was “Marine Ranching”. The delegates proposed nine regional studies, programmes, or experiences to support the case study development, and proposed a further 11 case studies or areas of interest that would be of relevance to a regional GSA.

Eleven regional priority areas were identified as needing consideration in the GSA development – the Eastern European and Central Asian groups identified five and seven priority areas respectively. While there were considerable overlaps in the priorities identified within the two regions, there were significant regional nuances within the priorities. The major priority focus areas included technology development, improved biosecurity and animal health, livelihoods and equitable development. An exception was the need to prioritize aquaculture governance which was identified as important to the Eastern European region, but not so in Central Asia.

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## **ACKNOWLEDGEMENTS**

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**ABBREVIATIONS AND ACRONYMS**

ANPA	National Agency for Fisheries and Aquaculture (Romania)
BMP	better management practices
CACFish	Central Asian and Caucasus Regional Fisheries and Aquaculture Commission
CCRF	Code of Conduct for Responsible Fisheries
COFI	FAO Committee on Fisheries
EAA	ecosystem approach to aquaculture
EIFAAC	European Inland Fisheries and Aquaculture Advisory Commission
EMFAF	European Maritime, Fisheries and Aquaculture Fund
EMFF	European Maritime and Fisheries Fund
EUSAIR	EU Strategy for the Adriatic and Ionian Region
GFCM	General Fisheries Commission for the Mediterranean
GMO	genetically modified organism
GSA	Guidelines for Sustainable Aquaculture
IMTA	integrated multi-trophic (extensive) aquaculture
OIE	World Organisation for Animal Health
RAS	recirculating aquaculture systems
RFB	Regional Fisheries Body
SCA	Sub-Committee on Aquaculture
SDGs	Sustainable Development Goals



## OPENING REMARKS

1. Mr Nathanael Hishamunda, FAO Team Leader, National Planning and Development Support Team, opened the webinar and welcomed the delegates to the consultative meeting. He recalled the initial call for the development of Guidelines for Sustainable Aquaculture (hereafter referred as “GSA”) that was made by Member States at the 9th COFI Sub-Committee on Aquaculture Session (Rome, 2017). He briefly described the GSA development pathway, and highlighted the need to hold regional consultations to inform the development of global best practice, to identify regional strengths and challenges to sustainable aquaculture development, and to establish regional priorities and case studies to improve our understanding of how sustainable aquaculture can be achieved. On behalf of the FAO Regional Office for Europe and Central Asia, Mr Nabil Gangi, FAO Deputy Regional Representative for Eastern Europe and Central Asia, welcomed the delegates to the consultation and provided a brief overview of the status of aquaculture development across Eastern Europe and Central Asia, contrasting regional disparities and development challenges. Mr Audun Lem, Deputy Director, FAO Fisheries and Aquaculture Division, emphasized the importance of the GSA consultation process in identifying pathways for successful and sustainable aquaculture development, and through their implementation, achieving the 2030 Sustainable Development Goals (SDGs). The full texts of the opening statements are presented in Appendix 2.

## SESSION 1: SETTING THE SCENE

2. The Secretariat provided a historical context for the development of the GSA, the methodology, and the progress made to date in undertaking the regional expert consultation process. The objectives of the global GSA were stated as follows: (i) to provide practical guidance to government authorities and policymakers in their efforts to promote the implementation of the Code of Conduct for Responsible Fisheries (CCRF), and (ii) to engage and enable the aquaculture sector to effectively participate in the implementation of the 2030 Agenda for Sustainable Development.

3. In June 2019, an Expert Consultation was convened in Rome to develop a GSA methodology. The methodology was based on FAO guidelines provided in “Transforming food and agriculture to achieve SDGs”. A list of 72 thematic modules pertinent to sustainable aquaculture development was compiled, a gap analysis of existing aquaculture guidelines was completed, and an appropriate process and timeline for the development of the GSA was developed. In August 2019, the proposed GSA methodology and recommendations from the Expert Consultation were endorsed by the 10th Session of the COFI Sub-Committee on Aquaculture that was held in Trondheim, Norway. The endorsement of the methodology set the scene for a series of regional GSA expert consultations to inform the development of the global GSA.

4. The objectives of the regional consultations were stated as follows:
- share current policies and practices related to aquaculture in the region;
  - review existing regional and national sustainable aquaculture instruments;
  - develop a list of priority thematic modules, considering regional and national strengths and challenges;
  - propose and prioritize possible case study concepts linked to one or more thematic modules;
  - identify regional priority areas to be included in the GSA.
5. The expected outputs of the regional consultation were:
- a list of the existing regional governance instruments for sustainable aquaculture;
  - a list of the regionally prioritized thematic modules considering strengths and challenges for each of the 72 thematic modules;
  - a list of proposed case study concepts mapped to the thematic modules;

- a list of regional priorities to be included in the GSA with linkages to thematic modules and the proposed case studies.

6. The Agenda for the three-day consultation is presented (Appendix 3).

## **SESSION 2: EXISTING GOVERNANCE INSTRUMENTS IN EASTERN EUROPE AND CENTRAL ASIA**

7. Within their respective countries, the delegates reviewed the existing national legislative and regulatory frameworks, aquaculture development policies, strategies and plans, and best practice guidelines. A list of these documents is presented in Appendix 4. All the countries reported the development of dedicated aquaculture governance frameworks. Nevertheless, between countries and regions, there were considerable differences in the levels and complexity in the legal frameworks, governance instruments and planning frameworks. Arguably, such disparities are most pronounced between those countries in the Central Asian region, and those reporting from Eastern Europe. Most notably, those Eastern European countries falling under the jurisdiction of the European Union (Hungary, Poland, Latvia, Lithuania, Romania and Slovenia) are subject to the most complex and comprehensive legal frameworks, aquaculture planning systems, and sustainability codes and guidelines.

8. Group discussions were held to establish: a) the suitability of existing governance systems to effectively regulate aquaculture production, b) identify gaps in legislative and regulatory frameworks, c) identify areas where the implementation of existing governance systems was problematic due to inadequate resources or capacity, d) identify the need for Better Aquaculture Practices to inform the GSA. The major issues discussed were as follows:

- licensing and permitting – limited aquaculture permitting requirements or failure to comply with existing permit systems and requirements;
- poor quality farm inputs – poor quality of inputs and a lack of quality standards or inadequate capacity to monitor quality standards (e.g. feed and seed);
- product quality monitoring – absence of product quality / phytosanitary standards or an inability or lack of technical capacity or resources to comply to existing standards;
- trade, product import / export – trade regulations and difficulties in navigating product import / export requirements or compliance to requirements and standards;
- inadequate environmental monitoring – lack of monitoring protocols or capacity to monitor environmental impacts accruing to aquaculture e.g. farm effluents, pollution;
- poor on-farm biosecurity and animal health – lack of veterinarian protocols, diagnostic capacity, access to services and therapeutic drugs;
- conflicts for natural resources and use – water access, use and licensing, and competition for natural resources with other production sectors;
- lack of certification (requirements, guidelines, programmes) at both production systems levels (e.g. hatchery, feed mill, processing plant) and products (e.g. ova, fry, fish, feeds etc.);
- a lack of Better Management Practices (BMPs) available across the value chain.

### **Session conclusions**

9. All countries in the region have recognized the requirement for aquaculture governance systems, and to varying degrees, they have developed policy, legislative, regulatory and implementation mechanisms to support sectoral growth. There are significant differences in the complexity of the governance structures and systems in place, and there are some gaps in the governance frameworks in some countries. Of particular concern is the lack of institutional capacity and resources available to implement existing governance systems, particularly in the Central Asian countries.

## SESSION 3: THEMATIC MODULES

10. The GSA methodology as endorsed by the 10th COFI Sub-Committee on Aquaculture Session held in Trondheim, Norway (August 2019) comprises 10 chapters encompassing a list of 72 thematic modules relating to sustainable aquaculture. In essence, the thematic modules provide a list of reference points or issues that can be used to guide the further development of the GSA. The purpose of this session was to:

- critically review the 72 thematic modules with respect to their regional applicability, and where appropriate, recommend additions or changes to the modules;
- develop a list of regional strengths and challenges that should be taken into consideration when further developing the thematic modules / GSA;
- prioritize the chapters with respect to their regional relevance.

11. During the session, the delegates were split into two sub-regional groups (Eastern Europe and Central Asia), and tasked with discussing the thematic modules with a view to identifying gaps, regional strengths and challenges, and priorities for GSA development. The results of these discussions are presented in Appendix 5, and discussed during the plenary.

### Plenary discussion

12. The thematic modules of major relevance to the sub-regions and the regional strengths and challenges were discussed as follows<sup>1</sup>:

#### Chapter 1 Sustainable Aquaculture and the 2030 Agenda

##### a) Eastern Europe

###### *Relevant thematic modules:*

- 4 Gender and aquaculture
- 5 Sustainable livelihoods
- 6 Food security, nutrition and improved diets
- 7 Capacity development

###### *Strengths and challenges:*

While women are already included in aquaculture production, their numbers and roles need to be enhanced to achieve gender equality. Low levels of national and regional fish consumption limits markets for aquaculture products. Fish consumption needs to be increased to improve food security, nutrition, and increase the demand for aquaculture products. There are significant areas that are suitable for aquaculture development in the region, however, there is a lack of capacity development and training programmes to support farmers and mid-level decision makers.

##### b) Central Asia

###### *Relevant thematic modules:*

- 4 Gender and aquaculture
- 5 Sustainable livelihoods
- 6 Food security, nutrition and improved diets
- 7 Capacity development

###### *Strengths and challenges:*

Aquaculture is often practiced at a small-scale or household level where it plays an important role in supporting sustainable livelihoods in rural areas. Women are underrepresented in the aquaculture

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<sup>1</sup> The discussions to identify the regional priorities were initiated during this session and were finalized during the penultimate session on day three of the consultation. These regional priorities are presented under Section 5.

production sector. Regional fish consumption is significantly lower than the global average, limiting the demand for fish products, and negatively impacting human nutrition. In many countries, the post-soviet era has been characterized by a lack of technical capacity across all levels of the value chain - input suppliers, farmers, technical support services, and government / regulatory agencies.

## Chapter 2 Governance and planning of aquaculture development

### a) Eastern Europe

#### *Relevant thematic modules:*

- 15 Access rights to land and water bodies
- 18 Conflict resolution schemes
- 19 Theft prevention
- 23 Aquaculture planning and policy
- 25 Zoning
- 27 Enabling environment
- 33 Climate change and aquaculture

#### *Strengths and challenges:*

There is good aquaculture planning, guidance and policy development capacity in those countries within the orbit of the European Union, but less so for those countries outside the European Union (e.g. Georgia, Lithuania). Nevertheless, there are enabling institutional, legal and regulatory frameworks and research and development capacity within the region. Aquaculture zoning is needed in some countries (e.g. Georgia). The impacts and mitigation to climate change on aquaculture production in many countries has yet to be fully addressed. Some countries have issues with access rights to land and water to support aquaculture development.

### b) Central Asia

#### *Relevant thematic modules:*

- 14 Climate smart aquaculture
- 15 Access rights to land and water bodies
- 18 Conflict resolution schemes
- 23 Aquaculture planning and policy
- 25 Zoning
- 33 Climate change and aquaculture

#### *Strengths and challenges:*

There is limited knowledge pertaining to the likely impacts of climate change on aquaculture production. Mitigation measures to address climate change and the introduction of climate smart aquaculture are required. Access to water is of increasing concern across the region with some potential for conflicts with respect to transboundary water user rights (e.g. Kazakhstan, Uzbekistan, Kyrgyzstan and Tajikistan). In some countries, there is limited technical capacity within government agencies to support the development of an enabling environment for aquaculture development, and there is need for technical support to develop policy instruments, regulatory frameworks, and strategic planning. Few countries have implemented zoning schemes for aquaculture.

## Chapter 3 Biodiversity and genetic resources

### a) Eastern Europe

#### *Relevant thematic modules:*

- 34 Biodiversity, habitat, ecosystems functions and aquaculture
- 35 Genetic resource management, development and conservation
- 36 Species introduction and transfers for aquaculture purposes

*Strengths and challenges:*

In some countries, there is a good capacity with respect to genetic resource management (e.g. Hungary), while in other countries such capacity does not exist (e.g. Ukraine). Regional species conservation is supported through EIFAAC. There is a regional ecological risk associated with the introduction of alien species, and the dependence on wild caught juveniles to support some production sectors (e.g. eels) is a threat to wild stocks and sustainable aquaculture production. In some countries, there is a need to improve the genetic quality of existing culture species, and consider the introduction of new culture species (Ukraine, Lithuania).

## b) Central Asia

*Relevant thematic modules:*

- 34 Biodiversity, habitat, ecosystems functions and aquaculture
- 35 Genetic resource management, development and conservation
- 36 Species introduction and transfers for aquaculture purposes

*Strengths and challenges:*

There is limited capacity to monitor the impacts of aquaculture on habitats, ecosystem services and biodiversity. There is limited technical capacity and funding available to operate genetic resource centers (e.g. genetic / broodstock centers). There is poor compliance to regulatory controls with respect to the transboundary movement of fish, and a lack of technical awareness of the potential environmental impacts associated with alien species introductions. In some countries this manifests as a high risk of uncontrolled alien species introductions.

## Chapter 4 Better management practices in aquaculture

## a) Eastern Europe

*Relevant thematic modules:*

- 38 Business management
- 39 Risk management and insurance
- 41 Corporate social responsibility, including social license and public acceptability
- 42 Farmers' collaboration, clusters and professional associations
- 43 Environmental integrity
- 49 Wild and farmed seeds
- 50 Predator and unwanted organisms (plants, fish etc.) management control in aquaculture

*Strengths and challenges:*

Limited uptake or availability for crop insurance was reported across the region. There is a need to introduce risk management training and crop insurance products. In many countries, business management skills need to be improved (e.g. Ukraine, Lithuania). Enhanced farmer collaboration through the development of farmer associations or cooperatives needs to be supported in some countries (e.g. Ukraine, Slovenia). Enhanced environmental protection and the control predators such as cormorants and otters are required to secure production and fish farmer livelihoods (Hungary, Slovenia, Ukraine, Lithuania).

## b) Central Asia

*Relevant thematic modules:*

- 38 Business management
- 39 Risk management and insurance
- 42 Farmers' collaboration, clusters and professional associations
- 43 Environmental integrity
- 46 Better management practices and codes of practices

- 47 Resource use efficiency and reducing losses and wastes  
 48 Stocking density, polyculture, fertilization, environmental capacity and limits to growth

*Strengths and challenges:*

Aquaculture is viewed as a relatively new production sector in many countries. Many new entrants lack a technical understanding of the production sector, and business management skills are often poor. There are low levels or a complete absence of appropriate crop insurance products. Many government agencies lack the technical capacity and resources to advocate for, minimize or ameliorate the potential environmental impacts accruing to aquaculture development. Farmers often have little practical (vocational) training, and access to Better Management Practices (BMP) is limited in many regions, or those BMPs that are available are not widely distributed. Thus, many poorly or untrained farmers lack the technical knowledge to optimize production parameters and production outcomes. Resources (e.g. water, feed and seed) are often used inefficiently due to a lack of technical knowledge or poor farm design.

Chapter 5 Sustainable feed

a) Eastern Europe

*Relevant thematic modules:*

- 51 Nutrition, feed and feeding (formulation of natural, farm-made and commercial)  
 52 Use of fish, fish oil and fishmeal in aquaculture feed, use of alternative feed ingredients to fish oil and fishmeal i.e. algae, insect meal, single cell protein, plant protein, etc.

*Strengths and challenges:*

The use and availability of high quality commercially manufactured feeds is universal across the region. However, some countries have no or limited national feed manufacturing capacity, and are dependent on importing manufactured feeds. Importing feeds increase costs and supplies can be restricted when borders are closed, for example during the recent COVID 19 pandemic. The use of fishmeal and fish oil in aquafeeds, particularly for carnivorous species is viewed as unsustainable, and concerted efforts are required to develop plant-based aquafeeds.

b) Central Asia

*Relevant thematic modules:*

- 51 Nutrition, feed and feeding (formulation of natural, farm made and commercial)  
 52 Use of fish, fish oil and fishmeal in aquaculture feed, use of alternative feed ingredients to fish oil and fishmeal i.e. algae, insect meal, single cell protein, plant protein, etc.  
 53 Live feed

*Strengths and challenges:*

There is significant capacity to manufacture compressed pellet feeds, but limited regional capacity to manufacture high quality extruded aquafeeds. Most high-quality extruded aquafeeds (e.g. trout feeds) are imported into the region, increasing feed costs, and leading to relatively high feed production costs. Many commercial and farm-made feed manufacturers have a poor understanding of the nutritional principles required to formulate good quality aquafeeds. A poor understanding of on-farm feed management practices in many countries results in poor feed utilization and sub-optimal production outcomes. There are a limited number of high-quality protein / lipid sources produced within the region that can be used in aquafeeds, and regional capture fisheries are unable to support significant fishmeal and fish oil production - these products need to be imported from other regions, and at relatively high cost. A lack of trained fish nutritionists and feed standards in the region make it difficult for feed manufacturers to formulate good quality feeds. There is a poor understanding of how alternative protein sources to fishmeal can be used in fish feeds. In many countries there is a limited understanding of how to produce live feeds under controlled conditions.



## Chapter 6 Water Management

### a) Eastern Europe

#### *Relevant thematic modules:*

- 54 Water abstraction and conservation
- 55 Waste water and water quality management
- 56 Effluent, wastes management/disposal and wastewater use
- 57 Efficient energy use and alternative/renewable energy sources of energy in aquaculture (e.g.: solar, wind)

#### *Strengths and challenges:*

The adoption of Recirculating Aquaculture Systems (RAS) and solar power systems is viewed as a regional strength. In some countries, there is a need to expand the use of RAS systems to conserve water resources, improve waste management systems, identify and promote alternative energy sources, and improve the energy efficiency of production systems (e.g. Ukraine, Serbia)

### b) Central Asia

#### *Relevant thematic modules:*

- 54 Water abstraction and conservation
- 55 Waste water and water quality management
- 56 Effluent, wastes management/disposal and wastewater use

#### *Strengths and challenges:*

Some countries in the region have large volumes of riverine, lacustrine, and artisanal waters to support aquaculture development (Kyrgyzstan). Extensive and semi-extensive carp production resulting in low nutrient levels in effluent discharges is widely practiced. Regulatory frameworks pertaining to water use and abstraction are absent in some countries, or those that do exist, do not regulate all water users in a fair and transparent manner (Kyrgyzstan). In some areas, there is some potential for future conflicts in transboundary water use and supply – often linked to large scale Soviet era water use / irrigation schemes which at the time did not consider national boundaries. Within countries, there is potential for conflicts with other water resource users (e.g. hydroelectricity, irrigation schemes). Many small-scale farmers have a limited understanding of water quality management, best management practice in waste water management and effluent monitoring. Government agencies often lack appropriate water quality standards or monitoring and oversight capacity. Production sites are often developed with a poor understanding of water quality requirements, or in close proximity to adjacent farms and their effluent streams. Often producers have an insufficient technical understanding for the need and use of effluent remediation technologies. Many farmers do not treat / reduce nutrient loading in effluent waters prior to release - downstream effects of effluent release are rarely considered during farm design or operation (Kyrgyzstan).

## Chapter 7 Biosecurity, aquatic animal health and animal well-being

### a) Eastern Europe

#### *Relevant thematic modules:*

- 58 Biosecurity and aquatic health management
- 60 Animal wellbeing

#### *Strengths and challenges:*

Some countries have legislation that addresses animal welfare (e.g. Serbia), and those countries falling within the European Union are subject to EU animal welfare legislation. The use of RAS systems in the region poses some animal welfare concerns with respect to stocking densities, biosecurity and exposure to diseases. Ukraine reported the need to improve on-farm biosecurity and aquatic health management.

## b) Central Asia

*Relevant thematic modules:*

- 58 Biosecurity and aquatic health management
- 60 Animal well-being

*Strengths and challenges:*

There are insufficient numbers of trained veterinarians and diagnostic capacity (laboratories) at both government and private sector levels, resulting in a lack of surveillance for, and low capacity to diagnose and treat disease outbreaks (Kyrgyzstan). Farmers often have a poor understanding of appropriate farm / hatchery biosecurity protocols, on-farm animal health monitoring, and the use and application of therapeutic treatments and medicines. There is often a lack of awareness, or consideration for animal welfare issues.

## Chapter 8 Specific farming systems

## a) Eastern Europe

*Relevant thematic modules:*

- 63 Aquaculture in special environments
- 64 Capture based aquaculture and culture-based fisheries

*Strengths and challenges:*

Areas are available for the conversion of low-grade agricultural lands to aquaculture production. Restocking programmes to support capture-based fisheries are viewed as a regional strength. Of particular significance is the support to artisanal and recreational fisheries which provides markets for stocking material, thus benefitting farmers and hatcheries across the region.

## b) Central Asia

*Relevant thematic modules:*

- 61 Promotion of aquaculture innovation and technology adoption among users, including BMPs
- 64 Capture based aquaculture and culture-based fisheries

*Strengths and challenges:*

Culture based fisheries and stocking programmes were common during the Soviet era. There are promising prospects for the re-development of culture-based fisheries across the region. Many Soviet era government funded stocking programmes have been abandoned due to a loss of technical and seed (hatchery) production capacity, governance systems, and financial constraints. In some countries, hatchery capacity needs to be redeveloped to provide stocking material. Farmer training in many countries is limited and extension services are often poor or non-existent – there is a need to disseminate Better Management Practices to farmers.

## Chapter 9 Aquaculture value chains, consumers, markets and trade

## a) Eastern Europe

*Relevant thematic modules:*

- 67 Nutritional value, quality and safety of aquaculture products
- 68 Marketing of aquaculture products
- 71 Compliance with international standards
- 69 Fair and productive aquaculture value chains

*Strengths and challenges:*

Food safety and control systems are in place at a regional level. Some countries report challenges in attaining international production standards as their production levels are low and the investment required to attain the standards are high. Often, different markets have different quality standards further increasing compliance costs. In some countries, there is a need to introduce national product branding to support market development.

## b) Central Asia

*Relevant thematic modules:*

- 67 Nutritional value, quality and safety of aquaculture products
- 68 Marketing of aquaculture products
- 70 Quality certification and voluntary schemes

*Strengths and challenges:*

Product quality (phytosanitary) standards for fish products are available for products traded within the Eurasian Economic Union. There is a lack of enforcement of quality control standards or a lack of standards to monitor farm inputs (feed and seed), and the quality and safety of final products sold in the local market (Kyrgyzstan). Fish consumption is low across the region - lower than during the Soviet era. While regional consumption is growing, there is a need to introduce marketing strategies to increase the national / regional demand for fish products. In many countries, product certification has not been introduced (Kyrgyzstan). Efforts need to be made to improve the acceptability of aquaculture products across the region, and local markets need to be developed to ensure markets remain available when export markets are difficult to access (e.g. during the COVID-19 pandemic).

## Chapter 10 Aquaculture statistics and information

## a) Eastern Europe

*Relevant thematic modules:*

- 72 Monitoring, data and statistics

*Strengths and challenges:*

Some countries reported difficulties in complying to FAO and the General Fisheries Commission for the Mediterranean (GFCM) monitoring / data standards (e.g. Ukraine).

## b) Central Asia

*Relevant thematic modules:*

- 72 Monitoring, data and statistics

*Strengths and challenges:*

Data collection systems are weak making it difficult for government agencies to monitor production patterns or provide accurate data. Data that is collected is dispersed among many different government agencies making data collation problematic (Kyrgyzstan).

**Session conclusions**

13. Across the two sub-regions, 43 out of the 75 thematic modules were identified as priority areas for further GSA development (Table 1). At the sub-regional level, there was some variation in the thematic modules that were prioritized. Of the 43 prioritized thematic modules, 27 (62 percent) were identified as common to both sub-regions, with the remaining 16 thematic modules being identified as important to one sub-region, but not the other. The thematic chapter where similar priorities were identified were in:

Chapter 1 - Sustainable Aquaculture and the 2030 Agenda  
Chapter 3 - Biodiversity and genetic resources  
Chapter 5 - Sustainable feed  
Chapter 6 - Water Management  
Chapter 7 - Biosecurity, aquatic animal health and animal well-being  
Chapter 10 - Aquaculture statistics and information

14. Those thematic chapters that demonstrated the greatest variance between the regions (two or more thematic modules differed) were:

Chapter 2 - Governance and planning of aquaculture development  
Chapter 4 - Better management practices in aquaculture  
Chapter 8 - Specific farming systems  
Chapter 9 - Aquaculture value chains, consumers, markets and trade

**Table 1. Prioritized thematic modules for Eastern Europe and Central Asia**

<b>Chapter / Relevant thematic module</b>		<b>Eastern Europe</b>	<b>Central Asia</b>
<b>Chapter 1 Sustainable Aquaculture and the 2030 Agenda</b>			
4	Gender and aquaculture	✓	✓
5	Sustainable livelihoods	✓	✓
6	Food security, nutrition and improved diets	✓	✓
7	Capacity development	✓	✓
<b>Chapter 2 Governance and planning of aquaculture development</b>			
14	Climate smart aquaculture	x	✓
15	Access rights to land and water bodies	✓	✓
18	Conflict resolution schemes	✓	✓
19	Theft prevention	✓	x
23	Aquaculture planning and policy	✓	✓
25	Zoning	✓	✓
27	Enabling environment	✓	x
33	Climate change and aquaculture	✓	✓
<b>Chapter 3 Biodiversity and genetic resources</b>			
34	Biodiversity, habitat, ecosystems functions and aquaculture	✓	✓
35	Genetic resource management, development and conservation	✓	✓
36	Species introduction and transfers for aquaculture purposes	✓	✓
<b>Chapter 4 Better management practices in aquaculture</b>			
38	Business management	✓	✓
39	Risk management and insurance	✓	✓
41	Corporate social responsibility, including social license and public acceptability	✓	x
42	Farmers' collaboration, clusters and professional associations	✓	✓
43	Environmental integrity	✓	✓
46	Better management practices and codes of practices	x	✓
47	Resource use efficiency and reducing losses and wastes	x	✓
48	Stocking density, polyculture, fertilization, environmental capacity and limits to growth	x	✓
49	Wild and farmed seeds	✓	x
50	Predator and unwanted organisms (plants, fish etc.) management control in aquaculture	✓	x
<b>Chapter 5 Sustainable feed</b>			
51	Nutrition, feed and feeding (formulation of natural, farm-made and commercial)	✓	✓

<b>Chapter / Relevant thematic module</b>		<b>Eastern Europe</b>	<b>Central Asia</b>
52	Use of fish, fish oil and fishmeal in aquaculture feed, use of alternative feed ingredients	✓	✓
53	Live feed	×	✓
<b>Chapter 6 Water Management</b>			
54	Water abstraction and conservation	✓	✓
55	Waste water and water quality management	✓	✓
56	Effluent, wastes management/disposal and wastewater use	✓	✓
57	Efficient energy use and alternative/renewable energy sources of energy in aquaculture	✓	×
<b>Chapter 7 Biosecurity, aquatic animal health and animal well-being</b>			
58	Biosecurity and aquatic health management	✓	✓
60	Animal wellbeing	✓	✓
<b>Chapter 8 Specific farming systems</b>			
61	Promotion of aquaculture innovation and technology adoption among users, including BMPs	×	✓
63	Aquaculture in special environments	✓	×
64	Capture based aquaculture and culture-based fisheries	✓	✓
<b>Chapter 9 Aquaculture value chains, consumers, markets and trade</b>			
67	Nutritional value, quality and safety of aquaculture products	✓	✓
68	Marketing of aquaculture products	✓	✓
69	Fair and productive aquaculture value chains	✓	×
70	Quality certification and voluntary schemes	×	✓
71	Compliance with international standards	✓	×
<b>Chapter 10 Aquaculture statistics and information</b>			
72	Monitoring, data and statistics	✓	✓

## SESSION 4: CASE STUDY CONCEPTS

15. The GSA methodology calls for the identification of case study concepts to provide useful pathways, lessons learnt, and act as examples of sustainable aquaculture development that would be applicable to other countries or regions. The selection of the case studies is linked to the 72 thematic modules that provide the primary framework for the GSA development. It was noted that the case studies can be built on both success and failure (what leads to, or does not result in sustainable development). The objective of the session was to:

- identify case studies concepts and selection criteria amongst those proposed by the Expert Consultations (June 2019), the COFI-SCA (August 2019). The case studies are presented in Appendix 6;
- suggest additional case study concepts (if any);
- recommend a list of case study concepts, which includes links to the thematic modules, country(ies) and lessons learned.

16. The delegates were split into the same regional (Eastern Europe and Central Asian) groups as the previous day (Session 3). The tabular results of the group discussions are presented in Appendix 5.

### Group discussions

17. The delegates reviewed the 26 case studies outlined in Appendix 6, and indicated that all the case studies were relevant at either a national or regional levels, the exception being “Marine Ranching” which had been proposed at the COFI-SCA meeting in August 2019.

18. The delegates proposed the following regional studies / programmes or experiences to support the development of the case studies:

- Further Development of Full or Partial Recirculation Aquaculture Systems (RAS): Under FAO project TCP/ARM/3504, FAO installed RAS to support water conservation and improved productivity in freshwater fish farming in Armenia. The results of this project are an example of best practice for RAS development in the region. Further examples of the successful introduction of RAS technologies are also available from Hungary.
- Sustainable Intensification of Traditional Pond Aquaculture Systems: Central European countries have long histories in pond polyculture systems that could provide the basis for a case study (Serbia, Poland, Hungary, Albania, Ukraine).
- Reduction of the Potential Impact of Climate Change on Inland Fisheries and Aquaculture Sectors: The report of the EIFAAC International Symposium on Climate Change (Poland, 2017), provides case study examples. RAS systems in Hungary are used to mitigate impacts arising from climate change (Serbia, EIFAAC, Albania, Ukraine, Turkey).
- Water Resources Management, Including Land Water Interactions and Spatial Planning: Slovenian and Armenia studies on water use and mariculture development. (Serbia, Slovenia, Armenia, Albania).
- European Maritime and Fisheries Fund (EMFF) Subsidies for the Conservation and Sustainable Intensification of Pond Aquaculture: All countries within the orbit of the European Union have developed National Strategic Plans that can be used in case studies (Hungary, Slovenia and EU countries practicing aquaculture).
- Alternative Feed Formulations Based on Local Ingredients (global, Hasan, FAO): Under FAO TCP/SEC/3701, guidelines for feed manufacturing, supply, and on-farm feed management have been developed. A regional review of the status of feed manufacturing and on-farm feed management could also be used as the basis of a case study. Under an EIFACC programme, Serbia has introduced novel feed formulations to optimize carp pond production.

- Species Diversification, Alien Species: The EU project 2020 “DIVERSIFY” can be used to support the development of the case study.
- Adaptation to Climate Change: Under the EIFAAC “Climefish project”, Hungary has developed a Pond Aquaculture Decision Support Tool to assist pond farmers to adapt to climate change. The tool could be used to develop a case study.
- Environmental Issues, Spatial Planning, Waste Management, Efficient Energy and Water Use, and Reducing the Ecological Footprint of Aquaculture: In 2006, Turkey introduced a policy to move marine cage farms from inshore to offshore areas. The results included an improvement in inshore water quality, and reduced conflicts with other resource users (e.g. tourism industry). At the time, the policy change was received somewhat controversially by the industry. However, over time it has proved successful and beneficial to all stakeholders. The case study provides a good example of a zoning policy that reduces the ecological footprint of mariculture operations.

19. The delegates identified subject areas of regional importance where the development of case studies would be useful for the region. The proposed case studies and associated GSA Chapters and Thematic Modules were as follows:

- Social and Consumer Perceptions of Aquaculture and Aquaculture Products. Based on the EIFAAC: Farmed in the EU initiative; Ukrainian survey on attitudes to aquaculture. Chapter 9, TM 66 (Eastern Europe, Turkey).
- Impacts of Covid-19 on Aquaculture. Chapter 2, TMs 30, 31, 32 (Ukraine, Serbia).
- Integrated Aquaculture as a Mechanism to Broaden and Diversify Farmer Incomes. Chapters 1, 8 TMs 3, 5 62 (Hungary).
- Aquaculture Development for Warm Water Species and Broodstock Management. Chapter 8, TM: 61 (Kyrgyzstan, Uzbekistan, Azerbaijan).
- Certification Systems to Promote Market Access for Turkish Seabream and Seabass Products. Chapter 9 TMs: 70,71 (Turkey).
- The use of Aquaculture Development Zones (ADZ) to Promote Development and Improved Resource Management. Chapter 2, TM 24, 25, 27 (Turkey).
- Impacts and Measures to Reduce Escapees from Cage Farms. Chapter 4, TMs, 43, 47 (Central Asia).
- Support to Intra-Regional Cooperation in Aquaculture Development. Chapter 2, TM 18, 28 (Central Asia).
- Scientific and Technical Cooperation, Networking, Extension and Education. Chapter 2, TM 31, (Central Asia).
- The Role of the Private Sector in Providing Technology Transfers to Support Sector Development. Chapter 2, TM 22, 26 (Central Asia).

### **Session conclusions**

20. The delegates concluded that 25 of the 26 case studies proposed by the Expert Consultations (June 2019), the COFI-SCA (August 2019) were relevant to the region. The case study that was deemed not relevant to the region was “Marine Ranching”. The delegates proposed nine regional studies / programmes or experiences to support the development of the case studies, and proposed a further 11 case studies or areas of interest that would be of relevance to a regional GSA.



## SESSION 5: REVIEW AND FINALIZATION OF REGIONAL PRIORITIES

21. The session opened with the delegates once more being split into their respective Eastern Europe and Central Asia groups. The purpose of the session was to review and finalize the regional priorities that had been discussed during the previous sessions, and present these findings to the plenary.

### Plenary discussion

22. A total of eleven regional priority areas were identified as needing to be considered in the GSA development - the Eastern European and Central Asian groups identified five and seven priority areas respectively. While there were considerable overlaps in the priorities identified in the two regions, there were significant regional nuances within these priorities. The major priority focus areas included technology development, improved biosecurity and animal health, livelihoods and equitable development. An exception was the need to prioritize aquaculture governance which was identified as important to the Eastern European region, but not so in Central Asia. The regional priorities and the associated thematic modules were presented as follows:

#### a) Eastern Europe

1. *Technical Innovation*: Production systems in the region are dominated by traditional pond culture systems. There is a need for technology transfers and innovative new production technologies (e.g. RAS, IMTA, and aquaponics). Technologies for traditional pond production need to be upgraded, and focus placed on improving hatchery feed and seed production. Digitization systems need to be promoted.

Thematic Modules: 7, 14, 35, 36, 37, 44, 45, 46, 47, 49, 51, 52, 53, 54, 55, 56, 57, 61, 62, 65

2. *Environmentally Sustainable Production*: While traditional pond systems are relatively low impact and environmentally sustainable, mitigation measures need to be introduced to address climate change, predatory species (e.g. bird and fish predation), and the impact of water shortages on production systems.

Thematic Modules: 8, 9, 10, 12, 14, 20, 27, 30, 32, 33, 34, 35, 36, 43, 46, 47, 49, 50, 54, 55, 56, 57, 62, 63

3. *Aquaculture Governance*: There is a need for improved spatial planning, conflict resolution and mitigation, and a reduction in regulatory burdens. The introduction of “one-stop shops” for streamlining the processing of aquaculture authorisations and to support development planning were proposed.

Thematic Modules: 1, 2, 3, 4, 5, Chapter 2 (21–33), 72

4. *Economic and Social Sustainability*: Many traditional production systems generate low profits for small-scale farmers. Profitability for small-scale producers can be increased by developing markets and increasing the demand for products, species diversification, and the development of higher value products. Disaster risk management and economic support during crises (e.g. COVID-19) needs to be improved or developed.

Thematic Modules: 26, 38, 38, 39, 40, 41, 42, 61, 65, 66, 67, 68, 69, 70, 71

5. *Disease Control, Animal Health and Animal Welfare*: There is a shortage of approved therapeutants for use in aquaculture, and a need for improved indicators for animal welfare. Guidance on species specific husbandry practices (e.g. stocking density, water quality etc.) needs to be disseminated to farmers.

Thematic Modules: 29, 39, 58, 59, 60

## b) Central Asia

1. *Seed Production and Feed Supply*: The supply of good quality, cost effective feed and seed remains a production constraint in many countries. There is a need to improve hatchery capacity and production technologies. Feed manufacturers need technical support to formulate and manufacture high-quality, species and size specific feeds based on locally available feed ingredients. There is a lack of high-quality feed ingredients and feed additives in the region - particularly animal protein sources.

Thematic Modules: 51, 52, 53, 35, 36, 45, 58

2. *Better Management Practices*: Extension services are poor or non-existent in many countries, hampering knowledge dissemination to farmers. Better management practices to optimize production systems need to be disseminated e.g. hatchery, broodstock management and seed production, general fish husbandry, stock enhancement systems, feed management, water quality monitoring and effluent disposal, and predator control. Business management and risk management skills are also lacking.

Thematic Modules: 7, 38, 39, 44, 45, 46, 47, 48, 50

3. *Genetic Resource Management*: Endemic species conservation and genetic resource management is poor in many countries and needs to be improved. The high cost and technical requirements to operate long-term gene banking / broodstock programmes results in a limited capacity to operate such programmes - maintaining the genetic quality of seed stock in the region is problematic.

Thematic Modules: 7, 17, 20, 30, 33, 35, 36, 37

4. *Biosecurity and Fish Health Management*: Government and private sector aquatic veterinary services and fish health management support to farmers is limited across the region. There are low levels of disease monitoring and control, and limited control of the use of veterinarian therapeutics. There is a lack of therapeutic medicines registered as suitable for aquaculture, and minimal use of probiotics.

Thematic Modules: 7, 46, 58, 59, 60

5. *Water Management*: Many countries rely on transboundary water transfers to supply water. In times of shortage (e.g. drought, climate change), access to water becomes increasingly contentious, possibly leading to conflict. There is a need to improve on-farm water quality management - water quality monitoring, remediation, and pollution / effluent control.

Thematic Modules: 18, 33, 46, 54, 55, 56

6. *Livelihoods and Equitable Development*: There is a need for social equity and to empower women, youth and marginalized groups to participate in sector development. There is a need to support gender equality, sustainable livelihoods and social protection.

Thematic Modules: 3, 4, 5, 11, 16, 17, 69

## **SESSION 6: THE WAY FORWARD AND CLOSING SESSION**

23. Mr KwangSuk Oh, FAO Senior Fishery Officer, provided an outline of the further steps that needed to be taken to develop, ratify, and implement the GSA. The timeline for these activities were as follows:

- final regional consultations in the Near East and North Africa, North America and Europe (April 2021);
- selection and compilation of case studies (March–June 2021);
- drafting the GSA (June–September 2021);
- second global expert consultation to review the draft GSA (Sept. 2021);
- draft GSA submitted to the 11th session of the COFI-SCA (Mexico, 2021);
- technical consultation with members (April 2022);
- final GSA is submitted to COFI 35 for endorsement (September 2022);
- GSA Publication (2022/2023);
- implementation - 2022/2023 onwards.

### **Closing remarks**

24. Closing address was provided by Mr Matthias Halwart, FAO Team Leader, Sustainable Aquaculture — Global and Regional Processes. He thanked the delegates, facilitators, and support staff for their attendance and contributions. He noted that in the past, FAO has supported aquaculture development in the Eastern European and Central Asian regions, and will continue to do so in the future. He reiterated the importance of developing the GSA as a tool for guiding policy makers, enhancing sustainable aquaculture, and maximizing its contribution to the 2030 Agenda for Sustainable Development. He noted the importance of the regional consultation process in the GSA development process. The full text of the closing statement is presented in Appendix 2.

25. Mr Nathanael Hishamunda, FAO Team Leader, National Planning and Development Support Team, Sustainable Aquaculture Area, closed the meeting by providing a brief summary of the three-day meeting. He thanked the participants and FAO colleagues for their attendance and contributions.

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## **APPENDIX 2: OPENING AND CLOSING STATEMENTS**

### **WELCOME REMARKS BY MR VLADIMIR RAKHMANIN, ASSISTANT DIRECTOR-GENERAL AND REGIONAL REPRESENTATIVE FOR EUROPE AND CENTRAL ASIA DELIVERED BY MR NABIL GANJLI, FAO DEPUTY REPRESENTATIVE FOR EASTERN EUROPE AND CENTRAL ASIA**

*Distinguished participants, guests and colleagues,*

It gives me great pleasure to extend to you all a very warm welcome from the FAO Regional Office for Europe and Central Asia. As you may be aware, the FAO Committee on Fisheries (COFI) in 2018, recommended FAO to develop Guidelines for Sustainable Aquaculture, or GSA. In 2019, the COFI Sub-Committee on Aquaculture provided guidance on the development of the GSA, including support for regional consultations. To date, regional consultations have been held in Africa, Asia, Latin America, Pacific and Caribbean and this will be the fifth regional consultation of the series, and the fourth to be organized in a virtual environment. The 34th session of COFI held last month urged the further development of the GSA.

In 2018, total European fish production was 18.7 million tonnes with a trade value of 15.6 billion USD. Of this total production, aquaculture accounted for 18,1 percent. Atlantic salmon, rainbow trout, sea mussels, European seabass and common carp were the top 5 species by production quantity. European aquaculture is generally performed by small-scale enterprises, who uses comparatively advanced production, post-harvest and processing technologies and systems. High environmental standards and certification, conditions for fish farm licenses are known as the major constraint for aquaculture development in the European Union countries.

Fisheries in Central Asian countries, namely Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan decreased dramatically after the collapse of the Soviet Union in the early 1990s. Recovery trends of aquaculture are highly variable among countries. In 2018, fishery production from capture fisheries and aquaculture totaled 62 000 tonnes and 49 928 tonnes, respectively in Central Asia. Fish generally sold domestically in a live or fresh chilled form. Major challenges facing the Central Asian aquaculture industry include climate change, water stress, feed and seed supply, production and post-harvest technology and lack of investment.

Before I conclude, allow me to recall that the aims of this consultation, which are to:

- share current policies, practices and instruments related to aquaculture in the Eastern Europe and Central Asia regions;
- develop a list of thematic modules and related case studies considering regional strengths and challenges;
- and identify regional priority areas to be included in GSA.

We expect the GSA to provide practical guidance to government authorities and policymakers in their efforts of promoting the implementation of Code of Conduct for Responsible Fisheries (CCRF) and to engage and enable aquaculture to effectively participate in the implementation of the 2030 Agenda for Sustainable Development.

Once again, I thank all the participants in your efforts to join the consultation. With these few remarks, I would like to conclude by wishing you all a fruitful consultation.

Thank you.

**OPENING ADDRESS BY AUDUN LEM, DEPUTY DIRECTOR, SUSTAINABLE  
AQUACULTURE AREA LEADER, FAO FISHERIES AND AQUACULTURE DIVISION**

*Distinguished participants, guests and colleagues,*

On behalf of FAO, I wish you all a convivial welcome. We are looking forward to having a fruitful and enjoyable discussion together. I greatly thank all of you for your participation in the Eastern Europe and Central Asia regional virtual consultation towards the development of Guidelines for Sustainable Aquaculture.

Please allow me first to thank the FAO's Regional Office for Europe and Central Asia for their excellent support in organizing this virtual consultation. I would also wish to express my appreciation for their continuing endeavour to provide technical assistance to all the Eastern Europe and Central Asia Member Countries and to facilitate an inter-governmental dialogue on sustainable and responsible aquaculture development.

This regional consultation is an essential step towards achieving the Sustainable Development Goals through improvement of our knowledge on sustainable and successful aquaculture developments. It is also an essential move towards identification of possible success factors and pathways that provide suitable guidance to ensure its continued sustainable growth in all possible aquaculture sets and stages of development.

We look forward to working with you, Member Countries, to develop universally applicable and adequate Guidelines for Sustainable Aquaculture in the Eastern Europe and Central Asia regions.

I take this opportunity to also bring to your attention that FAO is the lead agency for celebrating the International Year of Artisanal Fisheries and Aquaculture (IYAFA) in 2022 in collaboration with other relevant organizations and bodies of the United Nations system. IYAFA 2022 is an important recognition of the millions of small-scale fishers, fish farmers and fish workers who provide healthy and nutritious food to billions of people and contribute to achieving Zero Hunger.

Let me close these opening remarks by wishing you all a fruitful meeting that will help put the outcome of this consultation to work for the benefit and growth of a truly sustainable aquaculture for all, without exception, in all the Eastern Europe and Central Asia regions.

**CLOSING ADDRESS BY MATTHIAS HALWART, TEAM LEADER, GLOBAL AND REGIONAL PROCESSES TEAM, SUSTAINABLE AQUACULTURE AREA, FAO FISHERIES AND AQUACULTURE DIVISION**

*Distinguished participants, guests and colleagues,*

On behalf of FAO, I would like to thank you, the participants, for your active participation and your valuable contributions over the past three days. I would also like to thank the organizers and facilitators for keeping us on track.

*Distinguished participants,*

Aquaculture has seen spectacular growth over recent decades, attaining another all-time record high of over 114 million tonnes in live weight in 2018, with a total farmgate sale value of over USD 263 billion. As you well know, the contribution of world aquaculture to world fish production has constantly increased, reaching 46 percent in 2018, up from 26 percent in 2000. And world aquaculture production has progressively surpassed that of capture fisheries; the “farming more than catch” milestones were reached in 1970 for aquatic algae, in 1986 for freshwater fishes, in 1994 for molluscs, in 1997 for diadromous fishes, and in 2014 for crustaceans (FAO, 2020).

FAO has actively supported ways to balance economic growth, social development, and sustainable use of aquatic living resources at global, regional and national levels, while simultaneously pursuing its universal goals of food security, nutrition and poverty eradication. However, sustainable aquaculture development has not been uniform globally, and the sector has performed differently in various contexts, countries and regions. Some aquaculture development efforts have failed to promote socioeconomic and environmental progress, while other efforts have proven successful, leading COFI to recommend that FAO develop Global Guidelines for Sustainable Aquaculture development.

Which is why we gathered for this event. To understand what has worked, and what has not worked, in the Eastern Europe and Central Asia regions; your regional or national priorities were discussed, reflecting your concerns and your hopes for the future of aquaculture development. To highlight the success stories, and analyse the failures, so that we can find lessons learned from the past as we look to the future. And to ensure that the regional contexts are well considered in the development of the Global Guidelines for Sustainable Aquaculture.

Your actions here over the last few days, your discussions and the eventual deliverables will pave the way towards enhancing sustainable aquaculture and maximizing its contribution to the 2030 Agenda for Sustainable Development. We believe in the possibilities of aquaculture, and we trust that your contribution to these Guidelines will support the increased economic, environmental and social sustainability of this important sector.

*Distinguished participants,*

Your active participation in the discussions that have taken place in the last three days is highly appreciated. Remember these will be your own Guidelines. Very informative suggestions were recorded during this gathering, and this progress is admirable given its limited duration and other challenges.

I would like to conclude by reminding you that the outcomes of all the regional consultations will inform and guide the development of the GSA; GSA will feature prominently in our discussions at the next COFI Sub-Committee on Aquaculture to be held in Mexico in November this year.

We hope, of course, that later this year it will be possible and normal again to physically meet but if not, or if only partially possible, we will ensure to make the most out of our increased ability to have virtual meetings and to record your valuable views and interventions this way.  
All the best and stay safe!

**APPENDIX 3: AGENDA****Day 1**

<b>Time (CEST)</b>	<b>29 March 2021</b>	
09.00–09.05	Instruction and Rules	Mr Nathanael Hishamunda, Team leader, FAO
09.05–09.15	Opening ceremony	Mr Nabil Gangi, Deputy Regional Representative for Europe and Central Asia for welcome remarks and Mr Audun Lem, Deputy Director, NFI Division, Sustainable Aquaculture Area Leader for opening remarks
09.15–09.30	Session 1: Introduction to GSA and the regional consultation	Mr KwangSuk Oh, FAO
09.30–09.45	Session 2: Existing Governance instruments and Thematic Modules of Importance	Ms Ana Menezes, FAO
09.45–09.50	Instructions for group discussions	Ms Yumi Son, FAO
09.50–10.00	Break	
10.00–11.50	Group A discussions (sessions I–II)	Ms Ana Menezes, FAO, Mr Haydar Fersoy, Facilitator, Ms. Yeseul Byun and Mr Pierre Murekezi, Rapporteur
	Group B discussions (sessions I–II)	Mr KwangSuk Oh, FAO, Mr Mirko Novakovic, Facilitator, Ms Elisabetta Martone and Ms Yumi Son, Rapporteur
11.50–12.00	Wrap-up	Mr Nathanael Hishamunda, FAO

**Day 2**

<b>Time (CEST)</b>	<b>30 March 2021</b>	
09.00–09.30	Group A summary and report (sessions I–II)	Mr Haydar Fersoy, Facilitator
	Group B summary and report (sessions I–II)	Mr Mirko Novakovic, Facilitator
09.30–09.50	Session 3: Case Study Concepts	Mr KwangSuk Oh, FAO
09.50–11.20	Group A discussions and reporting (session III)	Ms Ana Menezes, FAO, Mr Haydar Fersoy, Facilitator, Ms. Yeseul Byun and Mr Pierre Murekezi, Rapporteur
09.50–11.20	Group B discussions and reporting (session III)	Mr KwangSuk Oh, FAO, Mr Mirko Novakovic, Facilitator, Ms Elisabetta Martone and Ms Yumi Son, Rapporteur
11.20–11.25	Presentation of Regional Consultation Survey	Ms Yumi Son, FAO
11.25–11.55	Group A summary and report (session III)	Mr Haydar Fersoy, Facilitator
	Group B summary and report (session III)	Mr Mirko Novakovic, Facilitator
11.55–12:00	Wrap-up	Mr Nathanael Hishamunda, FAO

**Day 3**

<b>Time (CEST)</b>	<b>31 March 2021</b>	
09.00–09.15	Session 4: Introduction to Regional priorities	Mr Haydar Fersoy, FAO
09.15–10.30	Group A discussion of regional priorities	Ms Victoria Chomo, Facilitator
09.15–10.30	Group B discussion of regional priorities	Mr Haydar Fersoy, Facilitator
10:30–10.45	Break	
10.45–11.15	Plenary session for reporting back	Mr Haydar Fersoy and Ms Victoria Chomo
11.15–11.30	Session 5: Summary of the GSA EECA regional consultation	Ms Ana Menezes, FAO
11.30–11.40	Session 6: Presentation of Survey Results	Mr Rodrigo Roubach, FAO
11.40–11.50	Next steps on the development of the GSA	Mr KwangSuk Oh, FAO
11.50–12.00	Closing remarks	Mr Matthias Halwart, Team Leader, FAO

## APPENDIX 4. EXISTING GOVERNANCE INSTRUMENTS IN EASTERN EUROPE AND CENTRAL ASIA

### EXISTING REGIONALLY OR NATIONALLY DEVELOPED GSA AQUACULTURE GOVERNANCE INSTRUMENTS

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
<b>European Union</b>			
EU Maritime and Fisheries Fund (EMFF) 2014–2020 and the EU Maritime, Fisheries and Aquaculture Fund (EMFAF) 2021–2027	Fund	EU	Chapters 1, 2 and 12
EU Acquis (accession legislation for new EU members) – Ch 9	Legislation	EU	Chapter 9
European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC), FAO RFB, Article VI	Body	Europe	Chapter 12
Central Asian and Caucasus Regional Fisheries and Aquaculture Commission (CACFish) FAO RFB, Article XIV	Body	Central Asia and the Caucasus	Chapter 12 Membership: Armenia, Azerbaijan, Turkey, Kyrgyzstan, Tajikistan
General Fisheries Commission for the Mediterranean (GFCM), FAO RFB, Article XIV	Body	Mediterranean	Chapters 2, 4 and 12
European Maritime and Fisheries Fund – Ch 1, 2 and 12	Body	EIFAAC	Provides subsidies
EU Maritime Strategy Framework Directive	Directive	EU	
EU Water Framework Directive	Directive	EU	Chapter 6
EU Water Management Directive – link with Ch 6	Directive	EIFAAC	
EU Strategy for the Adriatic and Ionian Region (EUSAIR)	Strategy	Adriatic and Ionian seas	
Strategy for the sustainable development of Mediterranean and Black Sea aquaculture	Strategy	Mediterranean and black seas	
EU Strategic Guidelines for the Sustainable Development of Aquaculture	Guidelines	EU	Revised national strategic plans of aquaculture for the 2021–2027 programming period must be based on this document
Strategic Guidelines for the Sustainable Development of EU Aquaculture	Guidelines	EU Region	In preparation
<b>Albania</b>			
Law on Aquaculture No. 103/2016	Law	National	Approved: 20.10.2016

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
For some changes and additions in the Law of Aquaculture 103/2016 Law No. 22/2019	Law	Republic of Albania	Approved: 03.04.2019
National Fisheries Strategy 2016–2021	Strategy	Republic of Albania	Approved by Government
On the functioning of the committee for coordination of scientific, technical and economic research on fisheries and aquaculture. Regulation 1	Regulation	Republic of Albania	Approved: 22.04.2016
On determination of procedures for permitting equipment and public competition for exercising activity of land and aquaculture Regulation No.2	Regulation	Republic of Albania	Approved: 10.12.2014
<b>Azerbaijan</b>			
Water Code	Law	Azerbaijan	Approved: 26.12.1997
Fisheries Law (Act 1 of 1998)	Law	Azerbaijan	Approved: 27.03.1998
Law No. 1015-IVQD Amending the Fisheries Law (Act 1 of 1998)	Law	Azerbaijan	Approved: 27.06.2014
On the Implementation of the Fisheries Law (Act 1 of 1998) Presidential Decree No.722	Regulation	Azerbaijan	Approved: 13.06.1998
Regarding the validation of the regulation on issuing special permits (licences) for industrial fish-farming and catch of aquatic animals and fish. Ministerial Decree No.15	Regulation	Azerbaijan	Approved: 22.01.1998
Ministerial Decree on Aquaculture No. 256	Regulation	Azerbaijan	Approved: 14.06.2017
Rules for the use of water bodies for the needs of fishing and hunting farms. Ministerial Decree No. 82	Regulation	Azerbaijan	Approved: 08.05.2000
On acclimatization of fish and aquatic biological resources. Ministerial Decree No. 204	Regulation	Azerbaijan	Approved: 12.05.2017
<b>Bosnia and Herzegovina</b>			
Law on Fisheries	Law	Bosnia and Herzegovina	Approved: 10.07.2012
Law on Freshwater Fisheries	Law	Bosnia and Herzegovina	Approved: 17.12.2005
Law amending Law on Freshwater Fisheries	Law	Bosnia and Herzegovina	Approved: 01.01.2007
Law on the protection and welfare of animals	Law	Bosnia and Herzegovina	Approved: 26.02.2009
Marine Fisheries Act	Law	Bosnia and Herzegovina	Approved: 20.02.1989
Veterinary Law	Law	Bosnia and Herzegovina	Approved: 30.11.2002
Regulation on animal health conditions applicable to aquaculture and their products	Regulation	Bosnia and Herzegovina	Approved: 12.01.2011

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
and on preservation and control of certain diseases of aquatic animals			
Regulation determining the countries and territories from which the import into Bosnia and Herzegovina of certain aquaculture animals intended for breeding is allowed	Regulation	Bosnia and Herzegovina	Approved: 17.08.2011
Regulation on the veterinary health conditions that must be met when placing fish on the market	Regulation	Bosnia and Herzegovina	Approved: 01.01.2005
Regulation on animal health conditions in facilities for the production of fish and crabs	Regulation	Bosnia and Herzegovina	Approved: 23.02.2004
Regulation on the form, content and registration of licenses for aquaculture	Regulation	Bosnia and Herzegovina	Approved: 01.10.2005
Regulation determining the countries and territories from which the import into Bosnia and Herzegovina of certain aquaculture animal intended for breeding is allowed	Regulation	Bosnia and Herzegovina	Approved: 17.08.2011
<b>Georgia</b>			
Law of Georgia on Aquaculture (No.6408-IIS of 2020)	Legislation	Georgia	Approved: 24.06.2020 Management plan, allocation of zone Challenges on how to select zones and development of plans Permit system / zoning freshwater aquaculture and mariculture
On the composition, Organisation and activities and inter-agency council on aquaculture. Resolution No. 53 of 2021	Regulation	Georgia	Approved: 05.02.2021
On form and procedure for issuance of document certifying that something belongs to hydrobiont aquaculture. Order No.2-270 of 2121 of Minister of Environmental Protection and Agriculture	Regulation	Georgia	Approved: 09.03.2021
On determining the composition and charter of advisory council on aquaculture. Order No.2-271 of 2121 of Minister of Environmental Protection and Agriculture	Regulation	Georgia	Approved: 09.03.2021
On forms for aquaculture permit and extensive aquaculture permit Order No.2-272 of 2121 of Minister of Environmental Protection and Agriculture	Regulation	Georgia	Approved: 09.03.2021



Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
On composition, organisation and activities of inter-agency council on aquaculture. Resolution No. 53 of 2021	Regulation	Georgia	Approved: 05.02.2021
On conditions and certification requirements for placing on the market and import of aquaculture animals and products thereof and list of vector species. Resolution No. 597 of 2017	Regulation	Georgia	Approved: 29.12.2017
On health of aquaculture animals, requirements for products thereof, and prevention and control of certain diseases of water animals	Regulation	Georgia	Approved: 28.12.2017
On sampling plans and diagnostic methods for detection and confirmation of viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN). Resolution No. 636 of 2016	Regulation	Georgia	Approved: 30.12.2016
On sanitary rules for production and sale of fish products. Order No. 305/N of Minister of Labour, Health and Social Affairs	Regulation	Georgia	Approved: 27.11.2003
On drafting and approving management plans for inland reservoirs and fish farms. Order No. 163 of 2011 of the Minister of Energy and Natural Resources	Regulation	Georgia	Approved: 19.08.2011
<b>Hungary</b>			
National Strategic Plan of Aquaculture 2014–2023 and revised National Strategic Plan of Aquaculture 2021–2030 (Based on EU Strategic guidelines for the sustainable development of aquaculture)	Plan	Hungary	The revised National Strategic Plan on Aquaculture (2021–2030) is currently under development
Hungarian Fisheries Operational Plan (2014–2020, EMFF) Hungarian Fisheries Operational Plan Plus (2021–2027, EMFAF)	Plan	Hungary	
Fisheries and the Protection of Fish (Act CII of 2013)	Law	Hungary	Approved: 30.12.2013 Associated regulations need to be adopted
Laying down certain rules of fish farming and the protection of fish Decree No.133 of 2013 (XII.29.) The Ministry of Rural Development	Regulation	Hungary	Approved: 29.12.2013
The requisites for the support of actions aimed at the protection of the aquatic environment falling under priority Axis 2 of the Fisheries Operational Programme and co-financed by the European Fisheries Fund.	Regulation	Hungary	Approved: 24.11.2012

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
Decree No.110 of 2011 (X1.6) The Ministry of Rural Development			
Regarding the operation of fish hatchery plants and the offering and marketing of breeding fish and fish breeding materials. Decree No. 34 of 2011 (IV.28.) The Ministry of Rural Development	Regulation	Hungary	Approved: 02.07.2011
On animal health requirements for aquaculture animals and products, and on the prevention and control of certain diseases in aquatic animals. Decree No. 127 of 2008 (IX. 29.) Ministry of Agriculture and Rural Development.	Regulation	Hungary	Approved: 13.07.2013
Hungarian Fisheries Operational Programme 2014–2020 (currently being implemented) and Hungarian Fisheries Operational Programme 2021–2027	Programme	Hungary	
Ministerial Decree on Aquaculture Production	Legislation	Hungary	In preparation
<b>Kyrgyzstan</b>			
Aquaculture and Fisheries Development Programme in the Kyrgyz Republic (2019 – 2023) Government Resolution No. 546 of 2019	Programme	Kyrgyzstan	Approved:15.10.2019
Law "On Fisheries" (Act 39 of 1997).	Legislation	Kyrgyzstan	Approved: Amendments and additions as of 01.06.2013
Law “On Veterinary” (Act 175 of 2014).	Legislation	Kyrgyzstan	Approved: Amendments and additions as of 06/02/2015
Law “On Environment protection” (Act 53 of 1199).	Legislation	Kyrgyzstan	Approved: Amendments and additions as of 25.07.2016
Law “On license - permit system in the Kyrgyz Republic” (Act 195 of 2013).	Legislation	Kyrgyzstan	Approved: Amendments and additions as of 28.06.2016
On some issues of the Ministry of Agriculture, Food Industry and Land Reclamation of the Kyrgyz Republic” Government Decree No. 153 of 2020	Regulation	Kyrgyzstan	Approved:13.03.2020
On Fisheries Development Fund of the Kyrgyz Republic. Government Decree No. 162 of 2009	Regulation	Kyrgyzstan	Approved:10.03.2009

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
On the fisheries development and use of natural and artificial water bodies in the Kyrgyz Republic. Government Decree No. 561 of 2009	Regulation	Kyrgyzstan	Approved:07.09.2009
On the safety of feed and feed additives. Government Decree No. 268 of 2014	Regulation	Kyrgyzstan	Approved:22.05.2014
On the procedure for conducting state environmental expertise in the Kyrgyz Republic. Government Decree No. 248 of 2014	Regulation	Kyrgyzstan	Approved:07.05.2014
On adoption of the regulatory framework in the field of fisheries Government Decree No. 410 of June 24, 2015	Regulation	Kyrgyzstan	Approved:24.06.2015
On amendments and additions to the Decree of the Government of the Kyrgyz Republic "On issues of the Ministry of Agriculture and Land Reclamation of the Kyrgyz Republic" dated February 20, 2012 No. 140. Government Decree 381 of 2015	Regulation	Kyrgyzstan	Approved:19.06.2015
On adoption of rules for the protection of surface waters of the Kyrgyz Republic. Government Decree 128 of March 14, 2016	Regulation	Kyrgyzstan	Approved: 14.03.2016
On approval of acts in the field of veterinary medicine. Government Decree No. 528 of 2017	Regulation	Kyrgyzstan	Approved: 24.08.2017
On Implementation of regulatory framework in the fisheries sector delegated by the Government of the Kyrgyz Republic. Order of the Minister of Agriculture, Food Industry and Melioration of the Kyrgyz Republic No.4-dp of 2019.	Regulation	Kyrgyzstan	Approved:04.03.2019
<b>Latvia</b>			
National Strategic Plan for the development of aquaculture (2014–2020)	Plan	Latvia	Approved In line with EU regulations
National Strategic plan for aquaculture development (2021–2030)	Plan	Latvia	Under development In line with EU regulations
Operational Programme of the EU Maritime and Fisheries Fund (2014–2020)	Programme	Latvia	Approved
Operational Programme of the EU Maritime, Fisheries and Aquaculture Fund (2021–2027)	Programme	Latvia	Under development
Fisheries Law (1995)	Legislation	Latvia	Approved:12.04.1995

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
On the registration of aquaculture animal farms, certification of river basin zones, control of infectious aquaculture animal diseases on farms and in river basin zones, and requirements applicable to the placing of aquaculture animals on the market. Cabinet Resolution No. 251 of 1998	Regulation	Latvia	Approved: 14.07.1998
<b>Lithuania</b>			
National Strategic Plan for the development of aquaculture (2014–2020)	Plan	Lithuania	Approved In line with EU regulations
National Strategic plan for aquaculture development (2021–2030)	Plan	Lithuania	Under development In line with EU regulations
Operational Programme of the EU Maritime and Fisheries Fund (2014–2020)	Programme	Lithuania	Approved
Operational Programme of the EU Maritime, Fisheries and Aquaculture Fund (2021–2027)	Programme	Lithuania	Under development
Law on Fisheries (No. VIII-1756)	Legislation	Lithuania	Approved:27.06.2000
<b>Moldova</b>			
No reporting			
<b>Poland</b>			
National Strategic Plan for Aquaculture (for the period 2014–2020)	Plan	Poland	Approved In line with EU regulations
National Strategic plan for aquaculture development (2021–2027)	Plan	Poland	Under development In line with EU regulations
Act on Inland Fisheries	Legislation	Poland	Approved:01.07.1985
Act on the support of sustainable development of the fisheries sector with the use of the European Maritime and Fisheries Fund	Legislation	Poland	Approved:10.07.2015
Act on the support of sustainable development of the fisheries sector with the use of the European Fisheries Fund	Legislation	Poland	Approved: 29.05.2019
Act on animal health protection and fighting against infectious animal diseases and amending some other acts	Legislation	Poland	Approved: 10.07.2008
Establishing the list of non-indigenous fish species and the list of indigenous fish species and conditions of the introduction on non-indigenous fish species for which a permit is not required	Regulation	Poland	Approved: 18.12.2012
On permissions for activities with the use of non-indigenous fish	Regulation	Poland	Approved:06.07.2011
On fighting infectious diseases of aquatic animals	Regulation	Poland	Approved: 12.03.2009

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
Establishing the list of animal infectious diseases which are subject to preparedness plans	Regulation	Poland	Approved: 21.11.2008
On detailed veterinarian requirements for running activities concerning aquaculture	Regulation	Poland	Approved: 14.10.2008
On detailed veterinarian requirements for keeping quarantine places, rest places and places of water for the transport of aquatic animals	Regulation	Poland	Approved: 06.04.2006
Amending regulation establishing the requirements for health certificates of imported animals and products of aquaculture	Regulation	Poland	Approved: 27.09.2007
<b>Romania</b>			
Emergency Ordinance 23/2008 on fisheries and aquaculture	Legislation	Romania	Approved: 01.01.2008
Law on living aquatic resources, fisheries and aquaculture (Law No. 192)	Legislation	Romania	Approved: 19.04.2001
On the organisation, structure and functioning of the National Agency for Fishery and Aquaculture (Decision No.545 of 2010)	Regulation	Romania	Approved: 09.06.2010
Decision No.334/2016 of the National Agency for Fisheries and Aquaculture (ANPA)	Regulation	Romania	Approved: 22.09.2016
Order on the authorisation of the fishing of sturgeon for the purpose of artificial breeding for the production of juvenile fish for aquaculture and the population support for natural stocks and for scientific purposes, the public domain of the state for the purpose of practising commercial fishing in natural habitats except protected areas	Regulation	Romania	Approved: 13.04.2012
<b>Serbia</b>			
On control and certification in organic production and methods of organic production	Regulation	Serbia	Approved: 02.06.2020
On conditions for shipments for which no import and transit authorisation is required	Regulation	Serbia	Approved: 23.05.2019
<b>Slovenia</b>			
National Strategic Plan for the Development of Aquaculture in the Republic of Slovenia for the 2021–2030 Period (based on EU Guidelines for Sustainable Aquaculture)	Strategy	Slovenia	In preparation
Operational Programme for the implementation of the European Maritime, Fisheries and Aquaculture Fund in the Republic of Slovenia for the period 2021–2027	Operational programme, necessary for co-financed projects from EMFAF.	Slovenia	In preparation

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
Act on Livestock	Legislation	Slovenia	Approved: 12.02.2012 Animal husbandry including fish breeding animals
Freshwater Fisheries Act	Legislation	Slovenia	Approved: 30.05.2006 Inland fisheries management and restocking
Water Act	Legislation	Slovenia	Approved: 12.07.2002 Management of use of waters for economic purposes.
Environmental Protection Act	Legislation	Slovenia	Approved: 04.04.2006 Environmental preservation goals and conditions.
Nature Conservation Act	Legislation	Slovenia	Approved: 30.06.1999 Use of alien fish species
Animal Feed Act	Legislation	Slovenia	Approved: 24.11.2006
Amending the regulation on animal health requirements for aquaculture animals and products, and on the prevention and control of certain diseases of aquatic animals.	Regulation	Slovenia	Approved: 11.01.2013
Amending the regulation on commercial ponds	Regulation	Slovenia	Approved: 06.12.2012
<b>Tajikistan</b>			
On fish farming, fisheries and protection of fish stocks (Law No. 1021)	Legislation	Tajikistan	Approved: 19.09.2013
On Fish farming (Law No. 220)	Legislation	Tajikistan	Approved: 22.12.2006
Validating the regulation on the procedure for management of waterbodies for fisheries. Government Decree No.437	Regulation	Tajikistan	Approved: 05.11.2002
Fisheries Regulation No.313 validated by the Ministry of Agriculture and Environmental Protection	Regulation	Tajikistan	Approved: 23.10.2007
<b>Turkey</b>			
Sectoral policy on Fisheries (2019 –2023)	Policy	Turkey	Approved: 01.01.2019
Fisheries Law (No. 1380)	Legislation	Turkey	Approved: 22.03.1971 (reprint: 22.06.2003)

<b>Title of the existing regionally or nationally developed aquaculture governance instruments</b>	<b>Category (policy, guidelines, legislation, etc.)</b>	<b>Area (Country, Sub-region, Region, Sub-regional body)</b>	<b>Remarks</b>
Amending the Fisheries Law No. 7191	Legislation	Turkey	Approved: 06.11.2019
On the registration of aquatic genetic resources	Regulation	Turkey	Approved: 18.06.2012
Aquaculture Regulation No. 25507	Regulation	Turkey	Approved: 29.06.2004
On the support for good agriculture practices in aquaculture Notification No. 2009/11	Regulation	Turkey	Approved: 10.02.2019
On the supporting good agriculture practices in the field of aquaculture Notification No. 2017/50	Regulation	Turkey	Approved: 10.01.2018
On sustainable use and protection of aquatic genetic resources	Regulation	Turkey	Approved: 29.08.2012
On aquatic animal health and protection and fight against aquatic animal diseases	Regulation	Turkey	Approved: 31.01.2012
On veterinarian medical products	Regulation	Turkey	Approved: 24.12.2011
Notification on the monitoring of fish farming facilities	Regulation	Turkey	Approved: 13.06.2009
On the quality of shellfish waters Notification No. 2008/29	Regulation	Turkey	Approved: 02.06.2008
On support for processed aquaculture products Notification No. 2020/17	Regulation	Turkey	Approved: 12.06.2020
On state support for aquaculture Notification No. 2019/56	Regulation	Turkey	Approved: 22.11.2019
On the aquaculture research and practice centre of Ankara University	Regulation	Turkey	Approved: 17.02.2019
On state support for aquaculture Notification No. 201/33	Regulation	Turkey	Approved: 03.08.2016
On concession of aquaculture production rights in seas and inland waters and concession of use of water needed in aquaculture investments	Regulation	Turkey	Approved: 01.06.2011
on state support for breeding trout in disease-free trout hatcheries Notification No. 2019/57	Regulation	Turkey	Approved: 22.11.2019
Circular No. 2019/3 of the Aquaculture Registration Committee on registration of fish species	Regulation	Turkey	Approved: 26.12.2018
Circular No. 2018/2 of the Aquaculture Registration Committee on registration of fish species	Regulation	Turkey	Approved: 24.05.2017
Principle decision of the High Council of Protection of Cultural and Natural Assets concerning mariculture and aquaculture facilities at natural / historic sites	Regulation	Turkey	Approved: 19.12.2006
On implementation of the aquaculture regulation Circular No.2006/1	Regulation	Turkey	Approved: 01.01.2006

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
On leasing fisheries and aquaculture production sites Circular No.2003/46	Regulation	Turkey	Approved: 16.01.2004
Instructions on processing aquatic product processing facilities	Miscellaneous	Turkey	Approved: -
Regulation amending the aquaculture Regulation No. 25507	Regulation	Turkey	Approved: 15.10.2005
Regulation amending the regulation on concession of aquaculture production rights in seas and inland waters and concession use of water needed in aquaculture investments	Regulation	Turkey	Approved: 14.02.2017
Regulation amending the regulation on concession of aquaculture production rights in seas and inland waters and concession use of water needed in aquaculture investments	Regulation	Turkey	Approved: 11.04.2016
Notification amending the notification on the monitoring of fish farming facilities	Regulation	Turkey	Approved: 09.04.2010
Regulation amending Aquaculture Regulation No.25507	Regulation	Turkey	Approved: 30.05.2009
Regulation amending Aquaculture Regulation No.25507	Regulation	Turkey	Approved: 18.06.2007
<b>Turkmenistan</b>			
Law on Fisheries and conservation of aquatic biological resources			Approved: 01.01.2011
<b>Ukraine</b>			
On Aquaculture (Law No.5293-VI)	Legislation	Ukraine	Approved: 18.09.2012
On Fishery, Industrial Fisheries and Protection of fishing resources (3677-VI)	Legislation	Ukraine	Approved: 16.10.2011
On Fish, Aquatic Biodiversity and Fish Products (Law No.486-IV)	Legislation	Ukraine	Approved: 05.02.2003
Validating the regulation on the State laboratory of veterinary medicine of fish disease and biological diversity disease Order No.29 of the Ministry of Agrarian Policy	Regulation	Ukraine	Approved: 24.03.2004
On the implementation of and experimental project related to the procedure of artificial breeding, growing of aquatic biological resources and the use in special fish breeding enterprises and the conduct of auctions for the sale of regime of exploitation of fishery waterbodies by electronic auction Cabinet of Ministers Decree No. 1138	Regulation	Ukraine	Approved: 23.10.2019
Validating zoning of aquaculture areas	Regulation	Ukraine	Approved: 30.01.2013



Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
Order No. 45 of the Ministry of Agrarian Policy			
On the procedure for artificial breeding (reproduction) of aquatic bioresources and use thereof Order No. 414 of the Ministry of Agrarian Policy	Regulation	Ukraine	Approved: 07.07.2012
On the procedure for fish farming, fish growing and breeding of other live aquatic resources and management thereof in commercial fish farms. Order No.4 of the State Fisheries Committee	Regulation	Ukraine	Approved: 15.01.2008
About approval of the Standard agreement of lease of water objects Resolution № 420 of the Cabinet of Ministers of Ukraine	Regulation	Ukraine	Approved: 29.05.2013
On approval of typical lease agreement for use on lease conditions of a part of a fishery water body, water area (body of water) of inland sea waters, the territorial sea, the exclusive (marine) economic zone of Ukraine for aquaculture purposes. Resolution No. 981 of the Cabinet of Ministers of Ukraine	Regulation	Ukraine	Approved: 30.09.2015
About approval of the Standard agreement of lease of water objects” Resolution No. 420 of the Cabinet of Ministers of Ukraine	Regulation	Ukraine	Approved: 2905.2013
<b>Uzbekistan</b>			
On measures to improve the fishing industry Presidential Decree PP-2939.	Regulation	Uzbekistan	Approved: 1.05.2017 Establishment of the NFA, FSRI and fishery faculty under state agrarian university. Transfer of parts of natural reservoirs to the NFA.
On additional measures to increase the volume of cultivation of fish products. Presidential Decree PP-3505.	Regulation	Uzbekistan	Approved: 03.02.2018 Custom duty exemption (until 1 <sup>st</sup> January 2020) for imported fish feed. Establishment of a fishery faculty at Tashkent state agrarian university.

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
On additional measures for the accelerated development of the fishing industry. Presidential Decree PP-3657	Regulation	Uzbekistan	Approved: 06.04.2018 Establishment of an economic free zone. Natural water basins managed by the State Committee for Forestry transferred to the NFA. Approval of programme of measures 2018–2023.
On additional measures for the accelerated development of the fishing industry. Presidential Decree PP-4005	Regulation	Uzbekistan	Approved: 06.11.2018 With investment from the GoUZ Fund for Reconstruction and Development, the state share in the authorised capital of Ipoteka Bank was increased to USD 50 million and 50% of fisheries business loans will be guaranteed by this fund. Fish-clusters with an annual production of at least 50mt exempt from all taxes from 1 <sup>st</sup> January 2019.
On additional measures to support the livestock industry. Presidential Decree PP-4576.	Regulation	Uzbekistan	Approved: 29.01.2020 State subsidies to intensive fish farms that are members of the NFA.
On measures to support the fish industry and increase its efficiency. Presidential Decree PP-4816.	Regulation	Uzbekistan	Approved: 29.08.2020 Tax for the use of water resources for fish farms in artificial reservoirs to be calculated at the rates used for the irrigation of agricultural land (based on the difference between the volume of water

Title of the existing regionally or nationally developed aquaculture governance instruments	Category (policy, guidelines, legislation, etc.)	Area (Country, Sub-region, Region, Sub-regional body)	Remarks
			received and volume withdrawn).
On approval of normative legal acts regulating the allocation of subsidies to the livestock industry by the state Decree No. 280 of the Cabinet of Ministers	Regulation	Uzbekistan	Approved: 12.05.2020 Approval of subsidy allocations
On measures to create a fishing fund and lease natural reservoirs and sites to fishing enterprises Decree No. 593 of the Cabinet of Ministers	Regulation	Uzbekistan	Approved: 07.08.2017 Procedure for leasing of natural lakes approved and the Fisheries Development Fund (under the control of the NFA) established.
On measures for the integrated development of the fish farming industry. Decree No. 719 of the Cabinet of Ministers	Regulation	Uzbekistan	Approved: 13.09.2017 Approval of measures 2017–2021
On measures for improvement of fodder supplies to stockbreeding and aquaculture. Decree No. 845 of the Cabinet of Ministers	Regulation	Uzbekistan	Approved: 18.10.2017

## APPENDIX 5. WORKING GROUP RESULTS

### I. Session 3 - Thematic modules

#### Group 1 Results – Eastern European Region

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
<b>CHAPTER 1 Sustainable Aquaculture and the 2030 Agenda</b>		
4 Gender and aquaculture	Women are involved in aquaculture production	Need to achieve gender equality along the value chain
5 Sustainable livelihoods	Aquaculture production provides employment opportunities and development in rural areas (Slovenia / Hungary)	Level of fish consumption is low (Regional)
6 Food security, nutrition and improved diets	Eastern Europe: low fish consumption < 5 kg/capita/annum hinders investment in aquaculture. Low fish consumption contributes to obesity and poor diets	Need to increase fish consumption, food security and nutrition in the region, and hence demand for fish (Regional)
7 Capacity development	Significant area can be used for aquaculture production (Serbia)	Lack of capacity development programmes for farmers, lack of training for mid-level specialists (Regional)
<b>CHAPTER 2 Governance and Planning of Aquaculture Development</b>		
15 Access rights to land and water bodies		Need to improve access rights to land and water bodies (Ukraine)
18 Conflict resolution schemes		Need to resolve conflicts between aquaculture and other users (Ukraine)
19 Theft prevention		Need to introduce mechanisms to reduce stock theft (Ukraine)
23 Aquaculture planning and policy	Development of National Strategic Plans using European guidance and funds (EU Maritime and Fisheries Funding) in EU countries. Lack of technical capacity to develop planning and policy instruments (Georgia)	Small production sectors in many countries and low levels of available private investment (Serbia / Slovenia) Need to improve technical capacity to develop policy and aquaculture management planning (Georgia, Lithuania)
25 Zoning	No zoning of areas for aquaculture (Georgia)	Need to create Allocated Zones of Aquaculture (Georgia)
27 Enabling environment	Established legal, institutional and regulatory framework for aquaculture. Enabling environment with respect to research, education, and the diversity of water bodies (Ukraine, Slovenia)	

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
33 Climate change and AQ	Impacts of climate change are not adequately addressed. Aquaculture produces low levels of carbon dioxide (Ukraine, Serbia)	Impacts of climate change and mitigation measures need to be addressed (Ukraine, Serbia)
<b>CHAPTER 3 Biodiversity and Genetic Resources</b>		
34 Biodiversity, habitat, ecosystems functions and aquaculture	Significant biodiversity used in current pond farming systems (Hungary)	Need to develop pond aquaculture (Lithuania, Serbia) Risk of alien species introductions (Regional)
35 Genetic resource management, development and conservation	Established genetic resource management, conservation and technical experience (Hungary), but limited or absent genetic resource management capabilities in other countries. EIFAAC: regional conservation of native species eels management through EIFAAC/GFCM/ICES working group.	Dependence on wild spawn for some farmed species in Europe is a threat to wild stocks (EIFAAC – Regional) No capacity to improve genetic resources (Ukraine)
36 Species introduction and transfers for aquaculture purposes		Need to introduce new culture species (Ukraine / Lithuania)
<b>CHAPTER 4 Better Management Practices in Aquaculture</b>		
38 Business management		Business management skills need to be improved (Ukraine / Lithuania)
39 Risk management and insurance		Poor risk management practices, limited or unavailability of aquaculture insurance. Risk management training and enhanced availability of aquaculture insurance is required (Ukraine / Lithuania/Hungary/ Poland)
41 Corporate social responsibility, including social licence and public acceptability		Need to improve corporate social responsibility (Ukraine)
42 Farmers' collaboration, clusters and professional associations		Need to improve farmer collaboration through farmer bodies e.g. associations / cooperatives (Ukraine / Slovenia)
43 Environmental integrity		Need to improve environmental protection to mitigate potential production losses (Serbia)

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
49 Wild and farmed seeds		Dependence on wild seed to support grow-out production presents sustainability challenges e.g. European eels, Mediterranean tuna (EIFAAC – Regional)
50 Predator and unwanted organisms (plants, fish etc.) management control in aquaculture		Predators such as cormorants and otters threaten farmer livelihoods (Hungary / Slovenia, Ukraine / Lithuania)
<b>CHAPTER 5 Sustainable Feed</b>		
51 Nutrition, feed and feeding (formulation of natural, farm made and commercial)	Use of commercial feeds in aquaculture (Regional)	Some countries have no or limited national feed manufacturing capacity and are dependent on imports. This can increase feed costs and create supply problems - particularly when borders are closed (e.g. COVID-19). (Regional - Serbia, Slovenia, Lithuania and Ukraine)
52 Use of fish, fish oil and fishmeal in aquaculture feed, Use of alternative feed ingredients to fish oil and fishmeal i.e. algae, insect meal, single cell protein, plant protein, etc		Challenge for welfare and sustainability of wild stocks. Concerted efforts are required to develop feeds with higher levels of plant-based materials (Regional)
<b>CHAPTER 6 Water Management</b>		
54 Water abstraction and conservation		Need to invest in water conservation / RAS technologies, and improve controls over water abstraction. (Ukraine, Serbia)
55 Waste water and water quality management	RAS trout production systems developed to maintain water quality and minimise water consumption (Regional)	
56 Effluent, wastes management/disposal and wastewater use		Need to improve waste management and disposal systems, and promote alternative energy sources (Ukraine / Serbia)
57 Efficient energy use and alternative/renewable energy sources of energy in aquaculture (e.g.: solar, wind)	RAS systems and solar power systems available and used on farms. (Slovenia / Regional)	Need to improve the energy efficiency of farming systems (Ukraine)
<b>CHAPTER 7 Biosecurity, Aquatic Animal Health and Animal Well-Being</b>		

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
58 Biosecurity and aquatic health management		Need to improve biosecurity and aquatic health management (Ukraine)
60 Animal well Being	Existing law on animal welfare (Serbia) EIFAAC: research project completed on Animal Welfare in Aquaculture for Europe, guidelines published. EU legislation on animal welfare	RAS systems present a welfare challenge due to high stocking densities, and the potential to expose fish to disease. (Regional)
<b>CHAPTER 8 Specific Farming Systems</b>		
63 Aquaculture in special environments	Low grade agriculture areas can be converted to aquaculture (Serbia)	
64 Capture based aquaculture and culture-based fisheries	Restocking programmes support commercial inland, artisanal and recreational fisheries production, and diversify farmer incomes through the sale of seed (EIFAAC)	
<b>CHAPTER 9 Aquaculture Value Chain, Consumers, Markets and Trade</b>		
67 Nutritional value, quality and safety of aquaculture products	Food safety control systems in place (Regional)	
68 Marketing of aquaculture products		Challenges to reach international market quality standards as there are multiple standards, and with current low levels of production, compliance costs are relatively high. (Serbia, Ukraine)
71 Compliance with international standards		Compliance is challenging and not yet achieved. (Serbia, Ukraine)
69 Fair and productive aquaculture value chains		Need to develop national fish marketing brands. (Ukraine)
<b>CHAPTER 10 Aquacultures Statistic and Information</b>		
72 Monitoring, data and statistics		Challenge to meet FAO and GFCM standards (Ukraine)

## Group 2 Results – Central Asian Region

Note: during the workshop the results table could not be completed due to time constraints. While regional strengths were not fully discussed, regional challenges were discussed in some detail. The following table primarily provides a review of the regional challenges as discussed by the delegates.

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
<b>CHAPTER 1 Sustainable Aquaculture and the 2030 Agenda</b>		
4 Gender and aquaculture		Under representation of women in the production sector.
5 Sustainable livelihoods	Aquaculture is often practiced at a small-scale (family) level, and is an important component to sustainable livelihoods	
6 Food security, nutrition and improved diets		Regional fish consumption is significantly lower than global averages - there is a need to increase national and regional consumption.
7 Capacity development		Limited technical capacity across multiple levels (e.g. producers, government agencies, policy makers). Since the Soviet era, technical capacity has been lost across all levels of the value chain.
<b>CHAPTER 2 Governance and Planning of Aquaculture Development</b>		
14 Climate smart aquaculture		Limited progress in the introduction of climate smart aquaculture.
15 Access rights to land and water bodies		Conflicts increasing with respect to transboundary water use rights across the region, and conflicts likely to deepen (e.g. Kazakhstan, Uzbekistan, Kyrgyzstan and Tajikistan).
18 Conflict resolution schemes		
23 Aquaculture planning and policy		Limited technical capacity within government agencies to develop aquaculture policy / planning – there is a need for technical support and training.
25 Zoning		Few countries have implemented zoning schemes for aquaculture.
33 Climate change and AQ		Limited knowledge in terms of the likely impacts accruing to climate change on aquaculture production, and how to design and develop mitigation measures.
<b>CHAPTER 3 Biodiversity and Genetic Resources</b>		
34 Biodiversity, habitat, ecosystems functions and aquaculture		Low levels of environmental monitoring to establish the impacts of aquaculture on ecosystem health and services.
35 Genetic resource management, development and conservation		Limited technical capacity / funds to operate genetic resource centres (e.g. broodstock centres).



Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
<b>36 Species introduction and transfers for aquaculture purposes</b>		Poor compliance to regulatory controls on the transboundary movement of fish, lack of technical awareness of the issues related to alien species. In some countries a high risk of alien species introductions.
<b>CHAPTER 4 Better Management Practices in Aquaculture</b>		
38 Business management		Aquaculture is viewed as a relatively new production sector in many countries.
39 Risk management and insurance		Low levels / absence of crop insurance. Risk management needs to be improved in light of the COVID-19 pandemic - as the sector was ill prepared to address the supply, production and marketing issues caused by the pandemic.
42 Farmers' collaboration, clusters and professional associations	Many countries in the region have developed producer associations, farmer association and cooperatives.	Need to improve farmer collaboration and introduce Better Management Practices (Regional).
43 Environmental integrity		Many government agencies lack the technical capacity and resources to advocate for and minimise / ameliorate the potential environmental impacts accruing to aquaculture development.
46 Better management practices and codes of practices		Farmers often have little formal training. Access to Better Management Practices is limited in many countries.
47 Resource use efficiency and reducing losses and wastes		Resources (e.g. water, feed and seed) are often used inefficiently due to a lack of technical knowledge and poor farm design.
48 Stocking density, polyculture, fertilization, environmental capacity and limits to growth	History of carp polyculture in the region	Many poorly or untrained farmers lack the technical knowledge to optimise production parameters and production outcomes.
<b>CHAPTER 5 Sustainable Feed</b>		
51 Nutrition, feed and feeding (formulation of natural, farm made and commercial)		Limited capacity to manufacture high quality feeds. Most high-quality extruded feeds (e.g. trout feeds) are imported into the region leading to relatively high feed production costs. Many commercial feed manufacturers and farmers producing farm-made feeds have a poor understanding of fish nutrition, how to formulate aquafeeds, and optimise the use of their feed ingredients. Poor understanding of on-farm feed management practices in many countries results in poor feed utilisation and poor production outcomes.

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
52 Use of fish, fish oil and fishmeal in aquaculture feed, Use of alternative feed ingredients to fish oil and fishmeal i.e. algae, insect meal, single cell protein, plant protein, etc		Limited regional fishmeal and fish oil manufacturing capacity / supplies, forcing feed manufacturers to import products from other regions at relatively high cost. Limited number of locally available high-quality protein and lipid sources for use in aquafeeds. A lack of trained fish nutritionists in the region making it difficult to formulate good quality feeds at the local level. Poor understanding of how alternative protein sources to fishmeal can be incorporated into fish feeds.
53 Live feed	Generally, a good understanding of how to enhance natural productivity in semi-intensive / extensive carp polyculture systems.	In many countries there is limited understanding of how to produce live feeds under controlled hatchery conditions.
<b>CHAPTER 6 Water Management</b>		
54 Water abstraction and conservation	Some countries in the region have large volumes of riverine, lacustrine and artisanal waters suitable for aquaculture (Kyrgyzstan).	A history of transboundary water transfers leading to possible conflicts over water use rights in times of drought / climate change. Lack of regulatory frameworks pertaining to water use and abstraction in some countries (e.g. Kyrgyzstan). Conflicts with other water resource users (e.g. hydroelectricity, irrigation).
55 Waste water and water quality management		Many small-scale farmers have a limited understanding of water quality management, best management practice in waste water management and monitoring protocols. Government agencies often lack quality standards and oversight capacity. Farming sites are often developed with a poor understanding of water quality requirements or in close proximity to adjacent farms and their associated effluent streams.
56 Effluent, wastes management/disposal and wastewater use	Much of the regional carp production is extensive / semi-extensive resulting in low effluent discharges.	Poor technical understanding and use of effluent remediation technologies. Many farmers do not treat / reduce nutrient loading in effluent waters prior to release - downstream effects of effluent release are rarely considered (Kyrgyzstan).
<b>CHAPTER 7 Biosecurity, Aquatic Animal Health and Animal Well-Being</b>		
58 Biosecurity and aquatic health management		Lack of trained veterinarians and diagnostic capacity (laboratories) at both government and private sector levels – lack of surveillance for, and low capacity to diagnose and treat disease outbreaks. Poor understanding of farm and hatchery biosecurity, biosecurity

Chapters of thematic modules	Country / Regional strength	Country / Regional challenges
		protocols, on-farm animal health monitoring, and the application of therapeutic treatments and medicines.
60 Animal well-being		Lack of awareness of animal welfare issues.
<b>CHAPTER 8 Specific Farming Systems</b>		
61 Promotion of aquaculture innovation and technology adoption among users, including BMPs		Lack of BMPs disseminated to farmers.
64 Capture based aquaculture and culture-based fisheries	Culture based fisheries and stocking programmes were common during the Soviet era. There is good potential to redevelop culture-based fisheries in the region.	Many governments funded stocking programmes (Soviet era) have been abandoned due to loss of technical capacity, seed production capacity, governance systems, and financial constraints. In some countries, hatchery capacity needs to be redeveloped to provide stocking material.
<b>CHAPTER 9 Aquaculture Value Chain, Consumers, Markets and Trade</b>		
67 Nutritional value, quality and safety of aquaculture products	Product quality (phytosanitary) standards for fish products are available for products traded within the Eurasian Economic Union.	There is a lack of quality control standards and enforcement of standards to monitor farm inputs (feed and seed), and the quality and safety of final products sold in the local market (Kyrgyzstan).
68 Marketing of aquaculture products		Fish consumption is low across the region (lower than during the Soviet era). While regional consumption is growing, there is a need to introduce marketing strategies to increase the demand for fish products. Local markets need to be developed to ensure markets remain available when export markets are difficult to access e.g. during the COVID-19 pandemic (Regional). Efforts need to be made to improve the acceptability of aquaculture products (Regional).
70 Quality certification and voluntary schemes		Product certification has not been introduced (Kyrgyzstan).
<b>CHAPTER 10 Aquaculture Statistic and Information</b>		
72 Monitoring, data and statistics		Data collection systems are weak making it difficult for government agencies to monitor production patterns and provide accurate data. The data that is collected is difficult to access as it is dispersed among many different government agencies (Kyrgyzstan).

## II. Session 4 - Case study concepts

### CASE STUDY CONCEPTS – EASTERN EUROPE

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
Further development of Full or partial Recirculation Aquaculture Systems	Yes (Serbia, EIFACC, Slovenia, Hungary, Poland, Armenia, Albania, Ukraine)	27 7 54 61 62 39 70	Armenia	Armenia TCP/ARM/3504 FAO installed RAS for water conservation and improved productivity in freshwater fish farming.	-	Yes	FAO. 2017. New aquaculture system in Armenia reduces groundwater consumption [online]. In: <i>FAO Regional Office for Europe and Central Asia</i> [cited 31 July 2021]. <a href="http://www.fao.org/europe/news/detail-news/en/c/1072548/">http://www.fao.org/europe/news/detail-news/en/c/1072548/</a>	COFI-SCA (August 2019)
Sustainable intensification of traditional pond aquaculture systems	Yes (Serbia, Poland, Hungary, Albania, Ukraine)	23 8	Hungary Armenia	Long history of carp production (Eastern and Central Europe) under extensive pond systems (low inputs and low productivity). Introduction of RAS technology in Hungary / Armenia has improved production efficiencies.	-	No	-	COFI-SCA (August 2019)
Reduction of the potential impact of climate change on inland fisheries and aquaculture sector	Yes (Serbia, EIFAAC, Albania, Ukraine)	43 23 21 39 33	EIFACC project	-	-	Yes	Stanislaw Sakowicz Inland Fisheries Institute. 2018. Programme and Abstract Book of the EIFAAC International Symposium on "Adaptation of inland fisheries and aquaculture to climate change"	COFI-SCA (August 2019)

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
Water resources management, including land water interactions and spatial planning	Yes (Serbia, Slovenia, Albania)	54 55 56 43	Slovenia  Armenia (FAO)	-	-	Yes	<p>Flander-Putrlje, V., A. Bolje, J. Francé, M. Grego, V. Malačič, B. Petelin. 2020. <i>Possibilities for increasing the potential of mariculture sites on the coast and in the Slovenian sea.</i></p> <p>Nacionalni inštitut za biologijo. (Also available at <a href="http://www.ribiski-sklad.si/f/docs/Dokumenti/MOZNOSTI_ZA_POVECANJE_POTENCIALA_LOKACIJ_ZA_MARIKULTURO.pdf">http://www.ribiski-sklad.si/f/docs/Dokumenti/MOZNOSTI_ZA_POVECANJE_POTENCIALA_LOKACIJ_ZA_MARIKULTURO.pdf</a>)</p> <p>Aquarius. 2021. <i>Possibilities for increasing the potential of aquaculture sites on inland surface waters of the Republic of Slovenia.</i> (Also available at <a href="http://www.ribiski-sklad.si/f/docs/Dokumenti/Moznosti_za_povecanje_potenciala_lokacij_za_akvakulturo.pdf">http://www.ribiski-sklad.si/f/docs/Dokumenti/Moznosti_za_povecanje_potenciala_lokacij_za_akvakulturo.pdf</a>)</p> <p>Geološki Zavod Slovenije. 2021. <i>Possibilities for increasing the potential of aquaculture sites on inland groundwater in the Republic of Slovenia.</i> (Also available at </p>	

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
							<a href="http://sklad.si/f/docs/Dokumenti/MK/GP_Akvakultura_porocil_kon.pdf">sklad.si/f/docs/Dokumenti/MK/GP_Akvakultura_porocil_kon.pdf</a>	
European Maritime and Fisheries Fund (EMFF) Subsidies for the conservation and sustainable intensification of pond aquaculture	No (non-EU countries)  Yes (Hungary, Slovenia and EU countries practising pond aquaculture)	33	Compare solutions applied in different EU countries	-	-	No	Requirement: Development of national strategic plans to generate funding.	COFI-SCA (August 2019)
Increase efficiency through the use of fish by-products (use of tilapia fish skin to treat burns)	No (Serbia, Albania, EIFAAC, Slovenia)  Yes (Ukraine)		No case study proposed	-	-	No	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Social inclusion in rural aquaculture development (global)	Yes (Serbia, Albania)	5 4	No case study proposed	-	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
Alternative feed formulation based on local ingredients (global, Hasan, FAO)	Yes (Albania, Serbia, Ukraine)	5 51	Iran (EIFAAC)	-	-	-	FAO TCP/SEC/3701 project, the Network of Aquaculture Centres in Central and Eastern Europe (NACEE) prepared a desk study and on aquafeed manufacturing, supply and on-farm feed management in Eastern Europe and Central Asia.  THÜNEN INSTITUTE. 2021. <a href="#">Development of Sustainable Feeds for Rainbow Trout Based on Locally Available Feed Resources in the Islamic Republic of Iran</a> . [cited 31 July 2021]	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Efficient use of natural resources (global, live feeds management)	Yes (Serbia, Hungary)	51 53	No case study proposed	Use of natural productivity in extensive and semi-intensive carp polyculture in ponds (region). Some experimental systems demonstrating enhanced resources use efficiencies e.g. freshwater IMTA.	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Improvement in molluscs production for	No (Serbia, Ukraine)	25 39 55	No case study proposed	-	-	-	A case study would be useful for mollusc producers in	Expert Consultation on the

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
small scale farmers (global)	Yes (Albania, Bosnia and Herzegovina, Slovenia)						Albania, Bosnia and Herzegovina and Slovenia.	development of Sustainable Aquaculture Guidelines (June 2019)
How has aquaculture contributed to poverty alleviation, gender equality, youth, etc.?	Yes (Serbia, Albania, Bosnia and Herzegovina)	4 5	No case study proposed	-	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (JuneN 2019)
Environmental issues, spatial planning, waste management	Yes (Serbia, Slovenia, Ukraine, Bosnia and Herzegovina, Hungary)	23 26 43 46 54	No case study proposed	-	-	-	The case study should also include the role of ponds in water management / treatment (Hungary).	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Species diversification, alien species	Yes (Slovenia, Serbia, Hungary, Latvia, Bosnia and Herzegovina, Ukraine)	36 21 38 39	EU Project "Diversify"	-	-	-	Mylonas C.C., Robles R., Tacken G., Banovic M., Krystallis A., Guerrero L. & Grigorakis K.. 2019. <a href="#">New species for EU aquaculture</a> . Food Science and Technology 33(2): 22–26. Species diversification is important - not only alien species, but the identification of	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)



Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
							new indigenous culture species. The use of alien species is limited to culture in closed systems. In order to decrease FMFO, it would be advisable to develop herbivorous as opposed to carnivorous species.	
Seed improvement; genetics, breeding hybrids, escapees.	Yes (Serbia, Hungary, Albania, Ukraine)	36 38	No case study proposed	-	-	-	Experience with gene banking and broodstock development (e.g. common carp) and farmers receive support for using seed of registered breeds (Hungary).	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Feed improvement; fish meal replacement.	Yes (Serbia, Bosnia and Herzegovina, Slovenia, Albania)	51	Serbia	Improvement of carp quality using pellet feeds as opposed to traditional feeding practices.	-	-	THÜNEN INSTITUTE. 2021 <a href="#">FishForFood - Development of Low Costs Feeds for Tropical Aquaculture for Local/Regional Markets</a> . [cited 31 July 2021]. Researcher: Prof. Markovic (University of Belgrade)	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Disease prevention, diagnosis and biosecurity.	Yes (Serbia, Albania, Bosnia and Herzegovina, Ukraine)	59 60 58	No case study proposed	-	-	Yes	Aquatic Animal Alliance. 2020. <a href="#">Key aquatic animal welfare recommendations for aquaculture</a> .	Expert Consultation on the development of Sustainable Aquaculture

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
							<p>Matvienko, N., Maistrenko, M., Buchatsky, L., Didenko A. 2019. <a href="#">Diseases of different aetiologies in salmonids in Ukraine</a>. In: <i>BIOLOGIJA</i>. 2019. 65 (4): 273–282</p> <p>Matvienko N., Levchenko A., Danchuk O., Kvach Y. 2020. <a href="#">Assessment of the occurrence of microorganisms and other fish parasites in the freshwater aquaculture of Ukraine in relation to the ambient temperature</a>. In: <i>Acta Ichthyol. Piscat.</i> 50 (3): 333–348.</p> <p>Yu K., Matvienko N., Bryjová A. &amp; Ondračková M. 2018. <a href="#">Aquaculture as the possible vector in the spread of <i>Posthodiplostomum centrarchid</i> (Hoffman, 1958) (Digenea: Diplostomidae) in Europe</a>. In: <i>BioInvasions Records</i> (2018) 7(4): 427–432</p>	Guidelines (June 2019)
Adaptation to climate change.	Yes (Serbia, Bosnia and Herzegovina,	33	EIFAAC Symposium 2017	-	Yes	-	ClimeFish project. [online] [cited 31 July 2021] <a href="https://climefish.eu/">https://climefish.eu/</a> Hungary developed a Pond Aquaculture Decision Support	Expert Consultation on the development of Sustainable

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
	Ukraine, Albania)						Tool to assist pond farmers to adapt to climate change.	Aquaculture Guidelines (June 2019)
Role of extension and education in developing aquaculture.	Yes (Serbia, Slovenia, Ukraine, Bosnia and Herzegovina)	38 39 42	No case study proposed	-	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Connection of Research and Development (R&D) with the stakeholders, industry, producers.	Yes (Serbia, Bosnia and Herzegovina, Hungary, Albania, Slovenia)	7 68 69 60	No case study proposed	-	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Examples of support from the government; importance of policy/policies. A policy is needed to create a sustainable aquaculture industry.	Yes (Serbia, Albania, Slovenia, Bosnia and Herzegovina)	21 23 42	No case study proposed	-	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Conflict resolution and animal welfare.	Yes (Serbia, Slovenia)	60	No case study proposed	-	-	-	Segner, H., Reiser, S., Ruane, N., Rösch, R., Steinhagen, D. and Vehanen, T. 2019. Welfare	Expert Consultation on the development

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature / Comments	Proposed in/by
							of fishes in aquaculture. FAO Fisheries and Aquaculture Circular No. 1189. Budapest, FAO. <a href="http://www.fao.org/3/ca5621en/CA5621EN.pdf">http://www.fao.org/3/ca5621en/CA5621EN.pdf</a>	of Sustainable Aquaculture Guidelines (June 2019)
Positive and negative impacts of greater intensification and expansion of pond, tank and cage production systems.	Yes (Serbia, Bosnia and Herzegovina, Albania, Hungary, Ukraine)	60 63	No case study proposed	-	-	-	Hungary has developed pond-in-pond production systems - a type of combined intensive-extensive production system.	COFI-SCA (August 2019)
Ecosystem health and integrity promoted as best practice for sound business including biodiversity, biosecurity, One Health, climate-change resilience, and early warning.	Yes (Serbia, Bosnia and Herzegovina, Albania, Slovenia)	23 38	No case study proposed	-	-	-	-	COFI-SCA (August 2019)
Social perception and consumer perception of aquaculture and mariculture products.	Yes EIFAAC	66	No case study proposed	Consumer perception in Central Europe: EU Campaign (FARMS in the EU initiative); Ukrainian survey on social perceptions of aquaculture	Yes	-	European Commission. [online] EIFAAC: Farmed in the EU initiative. In: <i>Oceans and Fisheries</i> . [cited 31 July 2021] <a href="https://ec.europa.eu/fisheries/cfp/aquaculture_en">https://ec.europa.eu/fisheries/cfp/aquaculture_en</a>	Group Discussion

<b>Case study concept title</b>	<b>Relevant to the Region? (Y/N)</b>	<b>Thematic module supported</b>	<b>Country of case study</b>	<b>Possible Lessons learned</b>	<b>Possible authors</b>	<b>Already published (Y/N)</b>	<b>Literature / Comments</b>	<b>Proposed in/by</b>
Impact of COVID-19 and the lockdown on the aquaculture sector.	Yes Ukraine Serbia	30	Ukraine	Proposal to be developed	No	-	-	Group Discussion
multitrophic aquaculture as a mechanism to broaden and diversify farmers' incomes.	Yes Hungary	42	Hungary	Proposal to be develop a case study	No	-	-	Group Discussion

## CASE STUDY CONCEPTS – CENTRAL ASIA

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature	Proposed in/by
Further development of full or partial Recirculation Aquaculture Systems (incl. small scale hatchery systems).	Yes	Chapter 4. 45. Feed management 46. Better management practices Chapter 5. 52. feed production	Turkey	RAS feasible for small production systems (e.g. trout hatcheries). Not economically feasible larger grow-out systems. Proposal to include small-scale hatchery systems in the title.	-	-	-	COFI-SCA (August 2019)
Reduction of the potential impact of climate change on the inland fisheries and aquaculture sector.	Yes	Chapter 7. 58. Biosecurity Chapter 2. 14. Climate-smart Aquaculture 33. Climate change	Turkey	RAS systems can be used to mitigate climate change in trout culture. EU Project 2020 emphasized negative impacts on Climate Change as a major threat to trout culture in the region.	-	-	-	COFI-SCA (August 2019)
Alternative feed formulation based in local ingredients and improvement of feed formulations.	Yes	Chapter 5. 52. Alternative feed ingredients	Turkey	Feed is a major production cost (up to 60%) and it is possible to reduce formulation costs using cheaper fishmeal alternatives. Fish processing waste can be upcycled as feed for different culture species.	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature	Proposed in/by
Improvement in molluscs production for small-scale farmers (global).	Yes	Chapter 4. 47. Reduce waste	Turkey, Black sea, Romania	Low impact aquaculture systems.	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Environmental issues, spatial planning, waste management, efficient energy and water use, and reducing ecological footprint of aquaculture.	Yes		Turkey	Movement of marine fish farms from inshore to offshore areas in 2006. Improved water quality, less conflicts with other resource users (e.g. tourism)	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Species diversification, alien species.	Yes		Turkey	A case study needs to be developed.	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Disease prevention, diagnosis and biosecurity.	Yes	Chapter 7.	-	A case study needs to be developed.	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Adaptation to climate change.	Yes		-	A case study needs to be developed.	-	-	-	Expert Consultation on the development

Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature	Proposed in/by
								of Sustainable Aquaculture Guidelines (June 2019)
Connection of R&D with and all levels of the value chain.	Yes		Turkey	A case study needs to be developed Proposed change of title to include all stakeholders in the value chain.	-	-	-	Expert Consultation on the development of Sustainable Aquaculture Guidelines (June 2019)
Ecosystem health and integrity promoted as best practice for sound business including biodiversity, biosecurity, One Health, climate-change resilience, and early warning.	Yes	Chapter 4 stocking density and carrying capacity	Turkey	A case study needs to be developed.	-	-	-	COFI-SCA (August 2019)
Animal welfare and biosecurity.	Yes	Turkey	Turkey	A case study needs to be developed.	-	-	-	COFI-SCA (August 2019)
Aquaculture development for warm water species and broodstock management.	Yes	Chapter 8. 61. Innovation and Technology adoption	Kyrgyzstan, Uzbekistan, Azerbaijan	A case study needs to be developed.	-	-	-	Group Discussion
The importance of the certification systems to promote market access for	Yes Turkey Azerbaijan	Chapter 9. 70. Certification scheme	Turkey	Certification scheme as a communication tool to connect to markets (Turkish	-	-	-	Group Discussion



Case study concept title	Relevant to the Region? (Y/N)	Thematic module supported	Country of case study	Possible Lessons learned	Possible authors	Already published (Y/N)	Literature	Proposed in/by
Turkish seabream and seabass products.		71. Compliance to int'l standard		seabream and seabass culture). With certification, Turkish marine product have better access to EU markets (With certification, Turkish fish products are exported to 80 countries including EU market).				
Best practices or reducing the ecological footprint in the aquaculture sector.	Yes	Chapter 8. 61. Innovation and Technology adoption	Turkey	Efficient resource use, renewable energy use, reduced plastic use in production and processing. Innovative practices and the use of technologies to reduce carbon footprint are being encouraged.	-	-	-	Group Discussion
Improving the market acceptability for freshwater aquaculture and mariculture products.	Yes	Chapter 9. 66. Public acceptance	Turkey	A case study needs to be developed.	-	-	-	Group Discussion
The use of Aquaculture Development Zones (ADZ) to promote development and improved resource management.	Yes	Chapter2. 24. Spatial planning 25. Zoning	Turkey	-	-	-	-	Group Discussion
Impacts and measures to reduce escapees from farms (cage culture).	Yes Turkey	-	-	A case study needs to be developed.	-	-	-	Group Discussion

<b>Case study concept title</b>	<b>Relevant to the Region? (Y/N)</b>	<b>Thematic module supported</b>	<b>Country of case study</b>	<b>Possible Lessons learned</b>	<b>Possible authors</b>	<b>Already published (Y/N)</b>	<b>Literature</b>	<b>Proposed in/by</b>
Intra-regional cooperation to support aquaculture development.	Yes	Chapter 4. 42 Farmer's collaboration	Turkey	-	-	-	-	Group Discussion
Scientific and technical cooperation, networking, extension and education to support aquaculture development.	Yes	-	-	A case study needs to be developed.	-	-	-	Group Discussion
The role of the private sector in providing technology transfers to support sector development.	Yes	-	-	A case study needs to be developed.	-	-	-	Group Discussion

### III. Session 5 - Regional priorities

#### REGIONAL PRIORITIES - EASTERN EUROPE

Additional regional priority	Linkage with case studies and the thematic modules	Regional strength	Regional weakness	Proposed by
1. Technical innovation.	<p>RAS, IMTA, upgrading pond aquaculture, technical innovation, genetic improvement of seed, fish feed innovation, aquaponics, exchanges between research and farmers.</p> <p><i>TMs: 7, 14, 35, 36, 37, 44, 45, 46, 47, 49, 51,52,53, 54,55, 56, 57, 61, 62, 65</i></p>		Digitalization.	Slovenia Hungary
2. Environmentally sustainable production.	<p>Environmental protection of genetic resources, climate change, control of predatory species.</p> <p><i>TMs: 8, 9, 10, 12, 14, 20, 27, 30, 32, 33, 34, 35, 36,43, 46, 47, 49, 50, 54, 55, 56, 57, 62, 63</i></p>	Most aquaculture is environmentally sustainable.	Poor understanding of environmental interactions – climate changes, water supply, etc.	Slovenia Serbia Albania
3. Governance.	<p>Spatial planning, policy, users' conflicts, specific regulations, reduction of overregulation and administrative burden (one-stop shops), establish specific inspectorates for aquaculture.</p> <p><i>TMs: 1, 2, 3, 4, 5, Chapter 2 (21–33), 72</i></p>		Policy, regulation, user conflicts in production (water, electricity) and in marine and freshwater aquaculture. Spatial planning.	Slovenia Serbia Ukraine Bosnia and Herzegovina
4. Economic and social sustainability.	<p>Consumer perception, need for producer organizations, diversification, aquaculture by-products and value addition, mitigation of crises.</p>		Need to increase economic performance for small-scale producers, need to improve market networks.	Ukraine Albania

Additional regional priority	Linkage with case studies and the thematic modules	Regional strength	Regional weakness	Proposed by
	<i>TMs: 26, 38, 38, 39, 40, 41, 42, 61, 65, 66, 67, 68, 69, 70, 71</i>			
5. Disease control, animal health and animal welfare	Disease control, antibiotics and vaccinations, indicators of animal welfare (e.g. stocking density), health surveillance systems.  <i>TMs: 29, 39, 58, 59, 60</i>		Lack of antibiotics and other medicines.	Slovenia

#### REGIONAL PRIORITIES - CENTRAL ASIA

Additional regional priority	Linkage with case studies and the thematic modules	Regional strength	Regional weakness	Proposed by
1. Seed and feed supply.	Alternative ingredient sources to fishmeal, improved feed formulations, use of live feeds.  <i>TMs: 51, 52, 53, 35, 36, 45, 58</i>	Small-scale seed and feed production capacity; Local and foreign fish feed production meeting int'l standards.	Capacity building for hatchery production, feed manufacturers (formulation) to produce high-quality feeds based on local feed ingredients; species specific feeds; lack of quality feed ingredients; poor seed quality and genetic banking.	Armenia Kyrgyzstan Turkey
2. Better Management Practices.	Business management; risk management; systems construction; stock and feed management; reducing losses and waste; fish husbandry; broodstock management and seed production; predator control.  <i>TMs: 7, 38, 39, 44, 45, 46, 47, 48, 50</i>	Most countries have producer associations that can be used for information dissemination.	Stock enhancement systems (e.g. hatchery, stocking programmes) need to be regenerated. Poor farmer extension services and dissemination of knowledge.	Armenia Kyrgyzstan

Additional regional priority	Linkage with case studies and the thematic modules	Regional strength	Regional weakness	Proposed by
3. Genetic resource management.	Genetic resource management, broodstock management programmes and maintaining genetic quality of seed stock.  <i>TMs: 7, 17, 20, 30, 33, 35, 36, 37</i>	Most countries have legislation to control the introduction of alien species	Poor management of endemic species and conservation of genetic resources; poor broodstock management and breeding techniques; high cost and technical support for operating hatchery broodstock centres.	Kyrgyzstan Armenia Azerbaijan Turkey
4. Biosecurity and fish health management.	Provision of veterinarian services; therapeutant control and use; farm biosecurity, fish health management and welfare.  <i>TMs: 7, 46, 58, 59, 60</i>		Lack of government and private sector veterinary services and fish health management to support farmers; poor disease monitoring, control and biosecurity; limited control of the use of veterinarian therapeutics; lack of therapeutic medicines; minimal use of probiotics.	Armenia Uzbekistan Kyrgyzstan
5. Water management.	Water quality management; on-farm water quality, effluent monitoring and remediation; transboundary water transfers. <i>TMs: 33, 46, 54,55,56</i>	Abundance of water resources (Kyrgyzstan).	Transboundary water transfers leading to conflict; water quality monitoring and treatment; pollution control.	Azerbaijan Kyrgyzstan
6. Livelihoods and equitable development.	Equitable and inclusive development; gender equality and youth; Sustainable livelihoods and social protection.  <i>TMs: 3, 4, 5, 11, 16, 17, 69</i>	Governments promote aquaculture entrepreneurship for women, youth, low-income families.	Empowerment of women and youth; social equity and access for marginalised groups.	Uzbekistan Kyrgyzstan



**APPENDIX 6. PROPOSED CASE STUDIES CONCEPTS (PREPARED BY SECRETARIAT FOR USE DURING THE GROUP DISCUSSIONS)**

Number	Case study proposed	Proposed in
1	Further development of Full or partial Recirculation Aquaculture Systems	COFI-SCA (August 2019)
2	Sustainable intensification of traditional pond AC systems	COFI-SCA (August 2019)
3	Reduction of the potential impact of climate change on the inland fisheries and aquaculture sector	COFI-SCA (August 2019)
4	Water resources management, including land water interactions and spatial planning	COFI-SCA (August 2019)
5	EMFF Subsidies for the conservation and sustainable intensification of pond aquaculture	COFI-SCA (August 2019)
6	Increase efficiency through use of fish by-products (use of fish skin (tilapia) to treat burns)	Expert Consultation (June 2019)
7	Social inclusion of inhabitants in rural aquaculture development (global)	Expert Consultation (June 2019)
8	Alternative feed formulation based in local ingredients (global, Hasan, FAO)	Expert Consultation (June 2019)
9	Efficient use of natural resources (global, live feeds management)	Expert Consultation (June 2019)
10	Improvement in molluscs production for small scale farmers (global)	Expert Consultation (June 2019)
11	How has aquaculture contributed to poverty alleviation, gender equality, youth, etc.?	Expert Consultation (June 2019)
12	Environmental issues, spatial planning, waste management	Expert Consultation (June 2019)
13	Species diversification, alien species	Expert Consultation (June 2019)
14	Seed improvement; genetics, breeding hybrids, escapees	Expert Consultation (June 2019)
15	Feed improvement; fish meal replacement	Expert Consultation (June 2019)
17	Adaptation to climate change	Expert Consultation (June 2019)
18	Role of extension and education in developing aquaculture	Expert Consultation (June 2019)

Number	Case study proposed	Proposed in
19	Connection of R&D with the stakeholders/industry/producers	Expert Consultation (June 2019)
20	Examples of support from the government; importance of policy/policies. A policy is needed to create a sustainable aquaculture industry	Expert Consultation (June 2019)
21	Conflict resolution and animal welfare	Expert Consultation (June 2019)
22	Positive and negative impacts of greater intensification and expansion of pond, tank and cage production systems	COFI-SCA (August 2019)
23	Ecosystem health and integrity promoted as best practice for sound business including biodiversity, biosecurity, One Health, climate-change resilience, and early warning	COFI-SCA (August 2019)
24	EMFF Subsidies for the conservation and sustainable intensification of pond aquaculture	COFI-SCA (August 2019)
25	Marine ranching (MR)	COFI-SCA (August 2019)
26	AMR, biosecurity, animal welfare	COFI-SCA (August 2019)



**This document represents the final report of the Regional Consultation for Eastern Europe and Central Asia on the development of Guidelines for Sustainable Aquaculture (GSA) held from 29 to 31 March 2021 using the Zoom Platform. It was attended by 39 representatives from Member Countries in the Eastern Europe and Central Asia, and it is the fifth of a series of regional consultations to share current policies and practices, review the existing regional sustainable aquaculture instruments, develop a list of priority thematic modules and discuss regional case study concepts.**

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