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**SECOND EXPERT CONSULTATION ON THE DEVELOPMENT OF
GUIDELINES FOR SUSTAINABLE AQUACULTURE (GSA)**

Virtual Meeting, 18–22 October 2021

Report of the
Second Expert Consultation on the Development of Guidelines for Sustainable Aquaculture (GSA)
Virtual Meeting, 18–22 October 2021

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PREPARATION OF THIS DOCUMENT

This document was prepared within the framework of the development of the Guidelines for Sustainable Aquaculture (GSA). It provides a summary of the presentations, discussions, conclusions and recommendations of the Second Expert Consultation on the development of GSA, which was held virtually from 18 to 22 October 2021.

ABSTRACT

In line with the recommendation of the FAO Sub-Committee on Aquaculture of the Committee on Fisheries (COFI-SCA) made in 2017, as endorsed by the Committee on Fisheries (COFI) in 2018, regarding the preparation of the Guidelines for Sustainable Aquaculture (GSA), the FAO Fisheries and Aquaculture Division organized, virtually, the second Expert Consultation on the development of GSA from 18 to 22 October 2021. Thirteen experts from Africa, Asia, Latin America, the Middle East, and North America attended the consultation. They were supported by seven resource persons and the FAO Secretariat.

The objective of the consultation was to discuss and review the drafts of the GSA, the accompanying “Action-Oriented Guidance for Transforming Aquaculture for Greater Contribution to Achieve the SDGs: Key Interconnected Actions to Guide Decision-Makers and Practitioners (AOG)”, and the background document used for the preparation of the GSA and the AOG. The consultation significantly improved these three documents and technically endorsed the drafts of the GSA and the AOG.

The experts agreed to the next step of submitting these drafts to the next session of COFI-SCA for further guidance.

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ABBREVIATIONS AND ACRONYMS

AOG	Action-Oriented Guidance for Transforming Aquaculture for Greater Contribution to Achieve the SDGs: Key Interconnected Actions to Guide Decision-Makers and Practitioners
COFI	Committee on Fisheries (FAO)
COFI-SCA	COFI Sub-Committee on Aquaculture
FAO	Food and Agriculture Organization of the United Nations
GSA	Guidelines for Sustainable Aquaculture
IMTA	integrated multi-trophic aquaculture
min	minutes
NFI	FAO Fisheries and Aquaculture Division
SDG	Sustainable Development Goal

BACKGROUND

1. In 2018, the FAO Committee on Fisheries (COFI) endorsed the recommendation made by its Sub-Committee on Aquaculture (COFI-SCA) in 2017 that FAO should develop global Guidelines for Sustainable Aquaculture (GSA) to guide government authorities and policymakers in their efforts to promote the implementation of the Code of Conduct for Responsible Fisheries (CCRF) and enable aquaculture to effectively participate in the implementation of the 2030 Agenda for Sustainable Development.
2. In response to this recommendation, FAO convened the first Expert Consultation on the development of GSA, which was held in Rome, Italy, from 17 to 20 June 2019. The first Expert Consultation resulted in the production of a methodology for developing the GSA, including making use of existing guidelines; a methodology and criteria for selecting case studies aimed at providing lessons learned; a methodology for identifying lessons learned; a list of thematic modules that GSA should cover; and an updated roadmap for the production of GSA.
3. The outcomes of the first Expert Consultation were presented at the Tenth Session of COFI-SCA, held in Trondheim, Norway, from 23 to 27 August 2019. COFI-SCA commended FAO's work on the GSA and provided guidance on the way forward, including organizing regional consultations and noting the need to ensure that all regions be represented in these consultations. Following this recommendation, seven regional consultations were organized, namely for Africa; Asia; Latin America; the Pacific and the Caribbean; Eastern Europe and Central Asia; Near East and North Africa; and Europe and North America. Each consultation brought together government-appointed representatives, international organizations, research institutions, academia and civil society as well as fishery and aquaculture regional bodies.
4. In 2021, COFI requested FAO to “consider guidance for concrete actions for the sector – according to national contexts, capacities and priorities – on the social, economic and environmental dimensions of sustainable development and on climate change adaptation and mitigation” (FAO, 2022). In response to this request, the “Action-Oriented Guidance for Transforming Aquaculture for Greater Contribution to Achieve the SDGs: Key Interconnected Actions to Guide Decision-Makers and Practitioners” (AOG) was drafted.
5. Whereas the GSA, a long-term normative instrument, will advise government authorities and policymakers on what needs to be in place to achieve sustainable aquaculture, the AOG is a live document that can be revised frequently to adapt and adjust to new developments and to technological and scientific breakthroughs and will serve to advise policymakers and practitioners on how to support the implementation of the GSA and the achievements of the Sustainable Development Goals (SDGs). The AOG complements the FAO guidance on “Transforming Food and Agriculture to Achieve the SDGs” (FAO, 2018).
6. Within this context, the second Expert Consultation on the development of the GSA was held virtually from 18 to 22 October 2021. Thirteen experts from Africa, Asia, Latin America, the Middle East, and North America¹ attended the consultation. They were supported by seven resource persons and the FAO Secretariat. The list of participants is given in Appendix 1.

OPENING REMARKS

7. Mr Nathanael Hishamunda, Team Leader, National Planning and Development Support, FAO Fisheries and Aquaculture Division (NFI), welcomed the participants on behalf of the division.

¹ Experts identified from Europe were unable to attend the consultation due to unforeseen circumstances.

8. Mr Audun Lem, Deputy Director, NFI, delivered the opening remarks. In his presentation, he recalled that COFI-SCA had requested the development of the GSA, discussed the several regional consultations with Members organized by FAO, and stressed that this event was organized in the spirit of continued consultation on this task. He further highlighted the results achieved so far and FAO expectations from this consultation. The full text of the opening statement is reported in Appendix 2.

AGENDA, ELECTION OF CHAIR AND VICE CHAIR PERSONS, AND PROCESS

9. The Secretariat introduced the background as well as the objectives and agenda of the consultation, indicating that the objective of the consultation was to discuss and review the drafts of the GSA and the AOG as well as the background document used for the preparation of the GSA and the AOG. The agenda adopted by the consultation is presented in Appendix 3.

10. To lead the discussions, the consultation elected Mr Mohammad Pourkazemi, Researcher, Iranian Fisheries Science Research Institute, as Chair and Mr Giovanni Fiore Amaral, Deputy Director, National Commission on Aquaculture and Fisheries, as Vice Chair.

11. The drafts of the GSA and the background document were shared with the experts before the consultation, accompanied by the request that they review the documents and send their comments ahead of the meeting for compilation and discussion. Because of time constraints, the draft AOG was shared during the first day of the consultation.

12. The consultation was organized into plenary and breakout sessions. The experts and supporting resource persons were divided into two working groups based on the relevance of their expertise vis-à-vis the subjects under discussion.

13. Working group one comprised experts in biology, biosecurity and biodiversity, aquaculture systems and practices, and environment responsibility and discussed Chapters 3, 5, 6, 8, 10 and 11. Working group two comprised experts in aquaculture governance, planning, policy and strategy, economics, trade, value chains, gender and social responsibility and discussed Chapters 1, 2, 4, 7, 9 and 12.

14. Before breaking into groups, the Secretariat provided, in the plenary, an overview of the background document that supported the preparation of the GSA and the AOG, and presented each of the 12 chapters of the background document, which addresses 12 issues considered as key for the future of sustainable aquaculture expansion, namely: (i) Sustainable Aquaculture and the 2030 Agenda; (ii) Governance and Planning Aquaculture Development; (iii) Biodiversity and Genetic Resources; (iv) Best Management Practices in Aquaculture; (v) Sustainable Aquafeeds and Feeding; (vi) Water and Waste Management; (vii) Biosecurity, Aquatic Animal Health and Animal Well-being; (viii) Innovations and Technological Developments; (ix) Aquaculture Value Chains, Trade and Market Access; (x) Aquaculture Statistics and Information; (xi) Climate Change and Aquaculture Resilience, and; (xii) Capacity Development, Extension and Research.

15. The Secretariat introduced the AOG and the GSA in the plenary. The two documents were discussed only in the plenary.

MAIN OUTCOMES

16. The consultation:
 - Reviewed, discussed and significantly improved the three documents prepared by FAO, namely the drafts of the GSA, the AOG and the background document with its 12 chapters corresponding to 12 issues seen as key for the future of sustainable aquaculture expansion.
 - Technically endorsed the draft AOG and the draft GSA.
 - Provided specific guidance to the Secretariat on how to revise the background document discussed above (see Appendix 4).

CLOSING

17. The experts agreed to the next step of submitting the technically endorsed drafts of the GSA and the AOG to the next session of COFI-SCA for further guidance.

18. Mr Matthias Halwart, Team Leader, Global and Regional Processes, NFI, gave the closing remarks. He commended the experts for their attendance and active contribution. The full text of the closing statement is presented in Appendix 5.

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APPENDIX 2 – OPENING REMARKS BY AUDUN LEM, DEPUTY DIRECTOR, FAO FISHERIES AND AQUACULTURE DIVISION

Dear experts, guests and colleagues,

I would like to express my warm welcome to you all. We are looking forward to having a fruitful and enjoyable discussion together.

I greatly thank all of you for having kindly accepted to provide your technical expertise to this second Expert Consultation on the development of the Guidelines for Sustainable Aquaculture.

Dear participants,

The Sub-Committee on Aquaculture of the FAO Committee on Fisheries, during its Ninth Session, held in Rome, Italy, in October 2017, recognized the growing global significance of sustainable aquaculture development and its potential contributions to global food security and nutrition as well as to the achievement of a wide range of Sustainable Development Goal (SDG) targets. The Sub-Committee further recognized the increasing need for implementation of best practices in aquaculture in many countries and regions and recommended that FAO should develop global Guidelines for Sustainable Aquaculture (GSA).

Highlighting the importance of aquaculture for food security and nutrition, improved livelihoods, poverty alleviation, income generation, job creation and trade, particularly for small-scale producers, and noting the potential of sustainable aquaculture to help meet growing demand and fill the gap in global fish supply while recognizing the growing need for implementation of best practices in aquaculture, COFI, at its Thirty-third Session held in Rome in July 2018, endorsed the recommendation of the Sub-Committee that FAO develop the GSA to provide guidance to the sector.

In line with this recommendation, FAO organized the first Expert Consultation on the development of the GSA in June 2019. The consultation brought together 15 experts from governments, international organizations, research institutes and academia, ensuring all regions were represented. The experts produced methodologies for developing the GSA, including making use of existing guidelines, for selecting case studies and for identifying lessons learned. The experts further produced a list of thematic modules which the GSA should cover and an updated roadmap for the development of the GSA.

The outcomes of the work of the first Expert Consultation were presented at the Tenth Session of the Sub-Committee held in Trondheim, Norway, in August 2019. The Sub-Committee commended FAO's work on the guidelines and provided guidance on the way forward, including organizing regional consultations.

In this regard, seven regional consultations were held for Africa, Asia, Latin America, the Pacific and the Caribbean, Eastern Europe and Central Asia, Near East and North Africa, and Europe and North America. Each consultation brought together government-appointed representatives, international organizations, research institutions, academia and civil society as well as fishery and aquaculture regional bodies.

Participants to regional consultations shared current national and regional governance instruments for sustainable aquaculture development; reviewed these instruments and the thematic modules suggested by the first Expert Consultation and identified their strengths and weaknesses as well as related challenges and opportunities; selected regional priority areas from the list of thematic modules suggested by the first Expert Consultation; and proposed case studies relevant to their respective regions.

Dear experts,

These consultations paved the way for the Secretariat to produce the first drafts of the GSA and the Guidance for Transforming Aquaculture to Achieve the SDGs.

The aim of this consultation is to review and discuss these drafts to arrive at technically endorsed documents that will be shared with Members as they convene for the Eleventh Session of the COFI Sub-Committee on Aquaculture.

Let me close these opening remarks by wishing you all a fruitful meeting that will help put the contribution of the consultation on the map for the benefit and growth of truly sustainable aquaculture for all, without exceptions, and all world regions.

Thank you.

APPENDIX 3 – AGENDA

Session	Title	Objective	Format	Advance reading
Day 1: 3 hours	Plenary and group sessions: – Introduction to the second Expert Consultation and to the draft “Guidance for Transforming Aquaculture to Achieve the SDGs” (hereafter Guidance) – <i>Extended version</i> – Review of Chapters 1, 3, 6, 7, 8 and 9 of the draft Guidance – <i>Extended version</i>	– Discuss Guidelines for Sustainable Aquaculture (GSA) process and agenda, and raise awareness of the objectives and expected outputs of the second Expert Consultation – Review the first draft of the Guidance – <i>Extended version</i> – Review of Chapters 1, 3, 6, 7, 8 and 9 of the draft Guidance – <i>Extended version</i>	– Welcome remarks (10 min) – Introduction to the second Expert Consultation (10 min) – Introduction to the draft Guidance – <i>Extended version</i> (10 min) – Introduction to Chapters 1, 7 and 9 of the draft Guidance – <i>Extended version</i> (20 min) – Introduction to Chapters 3, 6 and 8 of the draft Guidance – <i>Extended version</i> (20 min) – Group discussion (50 min) – Break (10 min) – Group discussion (50 min)	– COFI-SCA reports – Report of the first Expert Consultation on the development of GSA – Draft of the Guidance for Transforming Aquaculture to Achieve the SDGs – <i>Extended version</i> , focusing on Chapters 1, 3, 6, 7, 8 and 9
Day 2: 3 hours	Plenary and group sessions: Review of Chapters 2, 4, 5, 10, 11 and 12 of the draft Guidance – <i>Extended version</i>	– Review of Chapters 2, 4, 5, 10, 11 and 12 of the draft Guidance – <i>Extended version</i> – Reporting back from groups	– Reporting back from working groups (20 min) – Introduction to Chapters 2, 4 and 12 of the draft Guidance – <i>Extended version</i> (20 min) – Introduction to Chapters 5, 10 and 11 of the draft Guidance – <i>Extended version</i> (20 min) – Group discussion (50 min) – Break (10 min) – Group discussion (50 min)	– Chapters 2, 4, 5, 10, 11 and 12 of the draft Guidance – <i>Extended version</i>

Session	Title	Objective	Format	Advance reading
Day 3: 3 hours	Plenary session: – Introduction to the draft Guidance for Transforming Aquaculture to Achieve the SDGs – <i>Action-oriented version</i> – Review of the draft Guidance – <i>Action-oriented version</i>	– Review the first draft of the Guidance – <i>Action-oriented version</i> – Reporting back from groups	– Reporting back from working groups (20 min) – Introduction of the draft Guidance – <i>Action-oriented version</i> (10 min) – Plenary discussion (90 min) – Break (10 min) – Plenary discussion (50 min)	– Draft of the Guidance for Transforming Aquaculture to Achieve the SDGs – <i>Action-oriented version</i>
Day 4: 3 hours	Plenary session: – Introduction to the draft Guidelines for Sustainable Aquaculture (GSA) – Review of the draft of the GSA	– Review the first draft of the GSA	– Introduction of the draft GSA (20 min) – Plenary discussion (70 min) – Break (10 min) – Plenary discussion (80 min)	– Draft of the Guidelines for Sustainable Aquaculture (GSA)
Day 5: 2 hours	Plenary session: – Technical endorsement of the revised drafts of the Guidance – <i>both Extended and Action-oriented versions</i> and the GSA – Next steps	– Technical endorsement of the revised drafts of the Guidance – <i>both Extended and Action-oriented versions</i> and GSA	– Technical endorsement of the revised drafts of the Guidance – <i>both Extended and Action-oriented versions</i> and GSA (100 min) – Next steps (10 min) – Closing remarks (10 min)	– Revised drafts of the Guidance – <i>both Extended and Action-oriented versions</i> and the GSA

APPENDIX 4 – RECOMMENDATIONS AND SUGGESTIONS ON THE 12 BACKGROUND CHAPTERS FOR THE PREPARATION OF THE GSA AND THE AOG

Chapters	Recommendations and suggestions
1. Sustainable Aquaculture and the 2030 Agenda	<ul style="list-style-type: none"> – Have a clear link between the chapters and the Sustainable Development Goals (SDGs); – Prioritize SDGs based on the aquaculture sector; – Clarify the context of application (global, regional and local); – Recommend a rigorous process to integrate SDGs at the regional or local level; – Focus on how to handle the conflicts among the SDGs as well as how to avoid trade-offs among the SDGs; – Add more information on the overview of thematic modules relevant to sustainable aquaculture and the SDGs; – Include the role of polycentric, participatory governance in setting priorities among the SDGs and avoiding trade-offs, where possible; – Identify the need for the aquaculture sector to decarbonize; – Consider aquaculture sector adaptation to climate change; – Take into account the expansion to offshore, the future of aquaculture in the high seas, and the emerging Biodiversity Diversity of Areas Beyond National Jurisdiction (BBNJ) regime; – Highlight the fact that legislation is not in itself an indication of good governance; – Take into consideration plant-based protein in sustainable protein.
2. Governance and Planning Aquaculture Development	<ul style="list-style-type: none"> – In the section titled “An Enabling Environment”, consider that aquaculture responsibility falls under local government in India; – Clarify the difference between governing, governance and government; – Address how to plan aquaculture; – Present a successful case study, for example Chile or Norway; – Add a recommendation to strengthen national capacity in aquaculture statistics; – Develop a glossary; – Highlight the need for a multidisciplinary team in planning and the importance of team composition; – Take into account the effectiveness and efficiency of using the existing policies; – Differentiate the capture fisheries and aquaculture sectors; – Consider the different interests of capture fisheries and aquaculture (conflict of interest); – Give high visibility to aquaculture governance and planning in national government policy.

Chapters	Recommendations and suggestions
3. Biodiversity and Genetic Resources	<ul style="list-style-type: none"> – Consider the Global Plan of Action for Aquatic Genetic Resources, which was endorsed by the Commission on Genetic Resources for Food and Agriculture; – Address the recommendations to Members and sector players; – Add a case study on salmon hatcheries releasing salmon in Alaskan waters as an aquaculture-based “very enhanced” fishery; – With reference to utilization and aquaculture, highlight genetic breeding as a tool for utilizing genetic resources to produce a fine variety for aquaculture.
4. Best Management Practices in Aquaculture	<p>In the section on aquaculture business management:</p> <ul style="list-style-type: none"> – Include data on different aquaculture species, for example freshwater aquaculture species; – Check recent data on feed cost in the overall fed-aquaculture cost; – Change the term farm business management, for example operation of the farm; – Present the new risks of the COVID-19 pandemic for aquaculture as a business. <p>In the section on environmental integrity, site selection and land use planning:</p> <ul style="list-style-type: none"> – Add information on land tenure in different countries; – Change the title to reflect the fact that the section refers mainly to land-based aquaculture. <p>In the section on farm management:</p> <ul style="list-style-type: none"> – Consider including integrated multi-trophic aquaculture (IMTA) and aquaponics in the sub-section on integrated aquaculture systems; – Highlight the importance of shellfish, macroalgae and microalgae in terms of environmental benefits and low environmental impacts; – Take into consideration the Resource Efficient and Cleaner Production (RECP) approach of the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP), which entails the continuous application of preventive environmental strategies to processes, products and services in order to increase efficiency and reduce risks to humans and the environment.
5. Sustainable Aquafeeds and Feeding	<ul style="list-style-type: none"> – Cover both feed and feeding conditions (for example the feed conversion ratio, fish densities and schedule of feeding) and feed management; – Include feed for both fish and invertebrates; – Consider including the dissemination of alien species (microfauna); – Add a paragraph on the use of probiotics and prebiotics, antibiotics, and so on; – Explain the trade-off between the cost increase due to the use of prebiotics and probiotics and the increase in production; – Consider easy access of small-scale farmers to cost-effective quality feed; – Add a paragraph on the use of local agricultural by-products and co-products added as feed ingredients; – Fill some gaps in the related gap analysis with available guidelines, the Code of Conduct for Responsible Fisheries (CCRF) and the Codex Alimentarius;

Chapters	Recommendations and suggestions
	<ul style="list-style-type: none"> – Consider the lack of guidance related to live feed as well as pathogens in aquaculture; – Clarify if data show the tonnes of feed needed for that production or the tonnes of fish and shrimp produced in Table 1, column 5; – Add information on the trade-off between automation and jobs, or on the evolution of job profiles, salaries and location of the labour force (for example remote control from a computer in the city); – Add a paragraph on additives to retain feed quality and food safety; – Add a paragraph on decarbonization by shifting diets from terrestrial food production to seafood; – Highlight the need for networking among farmers, feed factories, analytical laboratories and research institutes.
6. Water and Waste Management	<ul style="list-style-type: none"> – Consider both open-water cage systems and land-based aquaculture systems; – Take into account food production per volume of water used; – Consider the circular economy and adopt the circular economy vocabulary, for example by moving from wastes to co-products. This is the approach with IMTA; – Consider that water management is about responsible use of water resources in aquaculture, and waste management is more about the control of wastes and effluents in the natural environments; – Take into consideration aquatic organism health instead of aquatic animal health, as seaweeds also have health issues; – Detail who compensates and pays any credits or taxes in the section compensation; – Include seaweed pathogens since seaweeds account for 51.3 percent of worldwide mariculture production; – Add the Phosphorus Directive and Nitrates Directive, considering that phosphorus is more of an issue in freshwater and nitrogen is more of an issue in marine water; – Consider the following five certification/standard programmes that include seaweeds and IMTA: (i) the Organic Aquaculture Standards for the Canadian General Standards Board; (ii) the Seaweed Standard for the Aquaculture Stewardship Council and the Marine Stewardship Council; (iii) the FMC Better Management Practices for Seaweed Production for FMC Corporation and the New England Aquarium; (iv) the Seafood Watch Program of the Monterey Bay Aquarium; and (v) the Global Aquaculture Alliance for the Best Aquaculture Practices (BAP) Seaweed Farm Standard (in preparation); – Take into consideration the saline-alkaline water resources usable for aquaculture development.

Chapters	Recommendations and suggestions
7. Biosecurity, Aquatic Animal Health and Animal Well-being	<ul style="list-style-type: none"> – Focus on animal health instead of diseases; – Highlight the need for guidance on diseases for developing countries; – Add more information on antimicrobial resistance (AMR); – Define well-being and welfare; – Use the term “members” for the World Organisation for Animal Health; – Include also freshwater aquaculture common species; – Include a section up front that considers which SDGs are relevant to each chapter; – For biosecurity, put greater emphasis on institutional capacity building at the national level, and policy and implementation frameworks; – Consider the link with SDGs only in Chapter 1 since the GSAs are not guidelines for specific SDGs.
8. Innovations and Technological Developments	<ul style="list-style-type: none"> – Develop Chapter 8 as a guidance to implement innovations instead of a review and provide examples of innovations; – Convince the private sector and decision-makers that innovation is worth it, including societal acceptability, technical issues, capacity building, understanding of economics and dissemination of information; – Include a paragraph on IMTA in seawater after the paragraph on aquaponics (a form of IMTA in freshwater); – Update the part on IMTA considering, for example, cases in Indonesia, the Philippines, the Republic of Korea and Viet Nam, and the developments in Brazil, Canada, Europe and so on; – Encourage and support scientists and technologists from universities and institutes to collaborate with fish farmers to understand the needs of aquaculture practices first-hand, and to innovate the techniques and tools urgently needed in aquaculture. <p>The working group noted that regulations in many countries are hindering innovations.</p>
9. Aquaculture Value Chains, Trade and Market Access	<ul style="list-style-type: none"> – Include guidelines; – Focus on what aquaculture should do to align to existing guidelines on fish utilization and trade from the value chain perspective (such as species, quality, sanitation), which could help sustainable aquaculture development.

Chapters	Recommendations and suggestions
10. Aquaculture Statistics and Information	<ul style="list-style-type: none"> – Consider the need to collect data to have economic and social dimensions; – Include some cases of how data collection benefits not only aquaculture production but way beyond aquaculture to target government policymakers and stakeholders who are recalcitrant; – Take into consideration data on disease burden, public health, surveillance and biosecurity; – Clarify the meaning of sustainable; – Consider that for any indicator of sustainability to be useful a baseline should be established; – Since the cost of data collection rises with numbers of variables or indicators, consider a limited number of key indicators, especially for African countries, where finance is limited; – Although sustainability is important, consider that for policymakers the contribution of aquaculture to gross domestic product and employment is key; – Consider that it is somewhat difficult to collect and analyse environmental sustainability aspects of aquaculture; – Consider that there can be legal protection of data when asking through departments and ministries but, for example, the National Bureau of Statistics (NBS) in some African countries have well established legal frameworks that cover agricultural statistics. <p>The working group noted that seaweed is often not included in the general statistics with other groups of aquaculture organisms and stressed that this can lead to distorted perspectives on aquaculture world production. The working group recommended FAO to treat seaweed just like any other aquaculture component together with fish and invertebrates among inclusive statistics, tables and figures.</p>
11. Climate Change and Aquaculture Resilience	<ul style="list-style-type: none"> – Add a recommendation to ensure that aquaculture and fisheries are well integrated in the national action plans on climate change; – Promote the economic use of molluscan shells (for example in construction) and seaweeds as a way to “transiently” store the carbon, nitrogen, phosphorus, etc., absorbed during cultivation; – Consider adaptation to climate change by aquaculture practices and species groups, for example the IMTA multi-crop diversification approach is an economic risk mitigation and management option to address pending climate change and coastal acidification impacts, hence increasing the resilience of the aquaculture sector; – Highlight the importance of strengthening national governance to strengthen the resilience of aquaculture to adapt to climate change; – Include resilience methodologies and how to measure the impacts of climate change (for example recirculating aquaculture system), and look at what is done in agriculture and the Convention on Biological Diversity work; – Encourage countries to classify the climate change impacts on the species. <p>The working group highlighted that aquaculture contributes to the resilience of food systems and it is resilient to various stressors.</p>

Chapters	Recommendations and suggestions
12. Capacity Development, Extension and Research	<ul style="list-style-type: none"> – Add case studies on how digitalization can be effective for extension services and dissemination of better management practices (BMPs); – Take into consideration how digitalization can improve the dissemination of BMPs; – Add a recommendation to strengthen national capacity on aquaculture statistics; – Support FAO initiatives to develop regional platforms and an online academy for capacity building, extension and research in aquaculture, i.e. according to the Intergovernmental Technical Working Group on Aquatic Genetic Resources for Food and Agriculture, the development of a global information system for aquatic genetic resources and the promotion of standardized use of nomenclature and terminology are needed; – Document traditional knowledge; – Emphasize the inclusion of aquaculture infrastructure as part of capacity building; – Take into account how to use information on farm business development in terms of income, especially in small-scale aquaculture; – Consider knowledge sharing and capacity building for actors within and outside the sector, including investors and the general public, and simplify the technical language for the latter. <p>The working group noted that Chapter 12 could be considered cross-cutting as all topics need capacity building.</p>

**APPENDIX 5 – CLOSING REMARKS BY MATTHIAS HALWART, TEAM LEADER,
GLOBAL AND REGIONAL PROCESSES TEAM, SUSTAINABLE AQUACULTURE AREA,
FAO FISHERIES AND AQUACULTURE DIVISION**

Dear experts, colleagues, ladies and gentlemen,

As we mark the end of a week-long Expert Consultation on the Development of the Guidelines for Sustainable Aquaculture (GSA), I wish to thank and commend you all for having made time out of your busy schedules to attend this important Expert Consultation.

Let me start with a quote by one of the dignitaries delivered at the grand opening of the Global Conference on Aquaculture Millennium +20 held just four weeks ago: “In terms of concrete steps, at global level, I would like to stress the importance of further progress toward the development of comprehensive and ambitious FAO Guidelines for Sustainable Aquaculture which we hope will see the light in 2022”.

You may have recognized the words of EU Commissioner for the Environment, Oceans and Fisheries Virginijus Sinkevičius. His words are representative of the high expectations by many of our Members. With this second Expert Consultation, you have taken another important step forward toward the Guidelines for Sustainable Aquaculture. I could listen to your deliberations this afternoon, and am also informed by my colleagues that in your discussions you set out to consider the advanced drafts of the GSA and the Guidance for Transforming Aquaculture to Achieve the SDGs and to revise and technically endorse them.

Your vigorous participation in the discussions that have taken place this week is a reflection of your commitment contributing to the sustainable development of global aquaculture. Please accept my congratulations on the excellent results of your work and of this Expert Consultation.

It is no wonder that the documents that you have revised and validated address the challenges that appeared most relevant to sustainable aquaculture development and formulate suitable actions by which these challenges can be overcome.

Your commitment here over the last few days and your discussions and deliverables will contribute to further paving the way towards enhancing sustainable aquaculture and maximizing its contribution to the 2030 Agenda for Sustainable Development.

Dear participants,

I would like to close this consultation by reminding you that the outputs of this Expert Consultation shall be made available at the Eleventh Session of the COFI Sub-Committee on Aquaculture for information and further guidance by the FAO Members.

On the COFI Sub-Committee, I would like to raise two points:

One, as you know, it is to be held in beautiful Mexico. We hope, of course, 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. To give you a heads-up, in consultation with the host country, we hope to be convening this next session in mid-March next year and await the official confirmation of dates and place.

Second, since the last session of the Sub-Committee, there has been a lot of development for the FAO Members to consider. Besides the progress made on the Guidelines, there has also been the endorsement of the draft Global Plan of Action for the Conservation, Sustainable Use and Development of Aquatic Genetic Resources (AqGR) at the recent Eighteenth Regular Session of the FAO Commission on Genetic Resources for Food and Agriculture, and I know this was part of your discussions. Of course, we have also successfully concluded the decadal Global Conference on Aquaculture Millennium +20, where participants unanimously adopted the Shanghai Declaration containing a vision, commitments, strategic priorities as well as the Call for Action.

Now I mention this because these various streams are very important in their own right, but we also need to make sure there is not too much proliferation but rather a convergence of guidance.

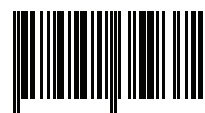
Well, all of this means we and you have a very busy 2022 ahead of us. I hope many of you experts will join your country delegations at the COFI Sub-Committee in March and at COFI in September.

Once again, many thanks to all of you for making this Expert Consultation such a success, and especially to the facilitators, resource persons, rapporteur and support staff for keeping this meeting on task.

All the best and stay safe!

This document represents the final report of the second Expert Consultation on the development of Guidelines for Sustainable Aquaculture (GSA), which was held virtually from 18 to 22 October 2021. The objective of the consultation was to discuss and review the drafts of the GSA, the accompanying “Action-Oriented Guidance for Transforming Aquaculture for Greater Contribution to Achieve the SDGs: Key Interconnected Actions to Guide Decision-Makers and Practitioners (AOG)” and the background document used for the preparation of the GSA and the AOG.

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