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COMMITTEE ON FISHERIES

SUB-COMMITTEE ON AQUACULTURE

Tenth Session

Trondheim, Norway, 23–27 August 2019

THE FAO FISHERIES AND AQUACULTURE DEPARTMENT'S EFFORTS IN IMPLEMENTING THE RECOMMENDATIONS OF THE PAST SESSIONS OF THE COFI SUB-COMMITTEE ON AQUACULTURE

Executive Summary

This working document contains an overview of the efforts made by the FAO Fisheries and Aquaculture Department towards implementing the major recommendations of the past sessions of the Sub-Committee on Aquaculture of the FAO Committee on Fisheries.

Suggested action by the Sub-Committee

The Sub-Committee is invited to:

- Review and comment on the information and background documents pertaining to FAO Fisheries and Aquaculture Department's efforts in implementing the recommendations of the past sessions of the COFI Sub-Committee on Aquaculture;
- Reflect on the progress and achievements and provide advice, as required, to strengthen and prioritize the recommendations in the next inter-sessional period; and
- Request Members and interested donors to provide financial and/or human resources to implement the priority areas in regards to aquaculture, as considered important by the Sub-Committee.

INTRODUCTION

1. The Ninth Session of the Sub-Committee on Aquaculture of the Committee on Fisheries (COFI-SCA) was held in Rome, Italy, from 24 to 27 October 2017. The Sub-Committee made a number of suggestions and recommendations, and identified several priority areas for future work towards achieving the full potential of aquaculture for national, regional and global food security, poverty alleviation, and human development. The report of the session is provided as an information document (COFI:AQ/X/2019/Inf.5).

MAJOR RECOMMENDATIONS AND SUGGESTIONS OF THE SUB-COMMITTEE

The contribution of aquaculture to food security and nutrition

2. In July 2018, FAO and WorldFish Center (WFC) signed a Memorandum of Understanding with a view to working together to build the resilience of fishers and fish farmers. The partnership will focus on enhancing the role of fish in improving people's food security, nutrition and livelihoods; providing policy advice to countries and driving high-level dialogue on fishery and aquaculture developments; and supporting countries in developing projects and programmes in sustainable aquaculture, small-scale fisheries and fish value chains.

3. Work is in progress to develop a nutrition-sensitive 'fish agri-food system' document to be incorporated into FAO's Nutrition Toolkit,[1] an integrated package of guidance on how to design, implement, monitor and evaluate nutrition-sensitive food and agriculture policies and programmes.[2] FAO has also incorporated nutrition-sensitive planning into inter-regional projects such as "Developing strategies for the inclusion of fish in school meals" (TCP/INT/3605), ongoing in Angola, Honduras, and Peru, and events such as the COFI 33 side event on "Achieving food and nutrition security through fisheries and aquaculture".[3] Work on "Fish as food" has also been strengthened through the Fisheries and Aquaculture (FI) Department's representation and input to the FAO Food Systems Task Force and the Urban Food Systems Task Force.

4. FAO has supported the diversification of rice production by farming aquatic animals in rice fields in Laos, supported in part by South-South Cooperation with China. The activities included implementation of small fish refuges within rice fields to increase availability and access to aquatic animals and plants during the dry season, improving significantly the nutrition of small-scale producers and their communities.[4]

5. FAO's International Symposium on Fisheries Sustainability, to take place in Rome, Italy, 18-21 November 2019, will build from a main session on the opening day dedicated to nutrition and food security in fisheries and aquaculture.[5]

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[1] www.fao.org/policy-support/resources/resources-details/en/c/884011/
[2] www.fao.org/news/story/en/item/1144888/icode/
[3] www.fao.org/fileadmin/user_upload/COFI/COFI33Documents/12Jul_Th_Nutrition.pdf
[4] Sirimanotham, C., Innes-Taylor, N., Halwart, M. 2019. Promoting "aquatic diversification" of ricefield environments for food and nutrition security in the Lao People's Democratic Republic. FAO Aquaculture Newsletter, N°60, pp. 22. www.fao.org/fishery/publications/fan/
[5] www.fao.org/about/meetings/sustainable-fisheries-symposium/en/

Aquaculture, the Sustainable Development Goals and FAO's common vision for sustainable food and agriculture

6. The FAO Aquaculture Branch (FIAA) continued its contribution to integrated programmes with other sectors through FAO's Strategic Framework and the Common Vision of Agriculture. Notable examples include multi-divisional collaboration with FAO's Plant Production and Protection Division (AGP) and Nutrition and Food Systems Division (ESN) on integrated agri-aquaculture and related work supporting the Agroecology Initiative,[6] the Blue Hope Initiative project with FishCode Unit[7] (FIDF) where employment is supported by integrating aquaculture and tourism, or the support provided in Ghana to the transition of traditional wood cutters into fish farmers in the mangrove area with FAO Ghana and the Forestry Department.

7. FAO held a Global Expert Consultation (EC) on the development of Sustainable Aquaculture Guidelines (SAG, see also COFI:AQ/X/2019/8). The objective of this EC was to come out with a methodology and roadmap for developing the SAG to be presented in August 2019 at the Special Event of the 10th session of the COFI-SCA. The SAG may be further developed and elaborated by convening regional expert meetings, subject to availability of financial resources. As recommended by the COFI-SCA and COFI in their respective last sessions, the SAG will provide practical guidance to government authorities and policy makers in their efforts to promote the implementation of the Code of Conduct for Responsible Fisheries (CCRF) but also in engaging and enabling aquaculture to effectively participate in the implementation of the 2030 Agenda for Sustainable Development.

8. With regards to reporting to the Sustainable Development Goals (SDG) indicators and CCRF surveys on aquaculture, there are at present no risks of duplicating monitoring efforts and over-burdening countries with monitoring requirements. There are at present no ongoing efforts of monitoring SDG indicators under FAO's custodianship that would focus specifically or explicitly on aquaculture. SDG indicator 14.7 includes consideration of aquaculture as a sub-sector that could contribute to Gross Domestic Product (GDP) in Small Island Developing States (SIDS), Least Developed Countries (LDCs) and other countries. Currently, an SDG 14.7 indicator methodology is being developed by FAO that will source data from statistics; these statistics are already available to FAO through GDP monitoring.

9. In 2017, there were suggestions to use responses to the biennial CCRF questionnaire for monitoring, follow-up and reporting on progress made in implementing the SDG targets relevant to aquaculture. In addition, the development process for the Sustainable Aquaculture Guidelines foresees recognition of, and reference to, aquaculture-specific responses to the biennial CCRF questionnaire.

10. It is recognized that individual responses by countries are not to be disclosed (see next section), and only aggregated data can be reported. In fact, member countries' aquaculture-specific responses to the biennial CCRF survey are always presented in aggregate form to Members in the Secretariat's respective Progress Reports. These aggregation efforts cover and describe trends in different regions and in different realms of management such as essential management measures (EMM), supporting measures (SM), enhancing mechanisms (ENM) and support capacity (SCP). Information on such aggregated trends could be assessed by FAO, if so desired, for possible monitoring and reporting to follow-up and review processes within the framework of the 2030 Agenda.

[6] www.fao.org/agroecology/home/
[7] TCP/INT/3702 - Blue Hope Initiative in the Mediterranean Sea

Progress of the implementation of the Code of Conduct for Responsible Fisheries (CCRF) provisions relevant to aquaculture and culture-based fisheries

11. The access of Members to the data of the CCRF questionnaire through web-based technology could not be increased because of data confidentiality. To alter the confidentiality of these data, a mechanism would need to be negotiated and adopted by Members. Diversly, some countries have voluntarily published the information reported to the CCRF on the public website of the responsible authority (e.g. Fisheries Divisions) with a goal to increase transparency and provide to the public information on the sustainability of the industry.

12. One proposed option could be to put the data in a benchmarking system so that each country may access its own situation, and carry out comparisons with the regional or global situation. This could also foster improvement from a response period to the next.

13. FAO has continued its support to regional fisheries bodies and aquaculture networks (RFBs and ANs) to promote the use of the CCRF and associated technical guidelines in the promotion of the sustainable development of aquaculture. During the 2019 survey, a significant increase of responses from RFBs/ANs was received as a result of FAO promotional efforts. Therefore, a deeper analysis was conducted and is presented as working document COFI:AQ/X/2019/3.

14. A specific section of working document COFI:AQ/X/2019/3 explains how the responses are being analysed at the regional level, and how the analysis can be used to support aquaculture development. The analysis helps identify what and where issues with implementation are occurring, and allows prioritization of efforts to better support implementation of the CCRF and the sustainable development of aquaculture. Another section explains how the issues relevant to aquaculture that scored less than two were addressed. Another section discusses correlations between CCRF implementation by members and support received from FAO.

The ecosystem approach to aquaculture (EAA) and spatial planning

15. On the occasion of the ten years of the ecosystem approach to aquaculture (EAA), a critical review and consideration of its future role in Blue Growth was published in a scientific journal to describe the experiences and lessons learned on EAA implementation, the new forces and developments with which the EAA has to contend, and an insight into its possible evolution in the next decade. Close links between the EAA and initiatives such as Blue Growth and Agroecology constitute significant opportunities for the future of the approach.[8]

16. The State of World Fisheries and Aquaculture 2018[9] indicates that substantial progress has been made in implementing elements of EAA, however, more projects that effectively consider fisheries and aquaculture as part of a single planning and management framework are needed. This is especially relevant in situations where it is difficult to separate fisheries and aquaculture, as in capture-based aquaculture and aquaculture-based fisheries, and where the spatial, operational and resource interactions between the two are increasing. Spatial planning of aquaculture, considering the social, economic and environmental dimensions of sustainability, is particularly important in the EAA framework, especially when aquaculture takes place in common property such as the sea or natural water bodies.

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[8] Brugère, C., Aguilar-Manjarrez, J., Beveridge, M.C. & Soto, D. 2018. The ecosystem approach to aquaculture 10 years on - a critical review and consideration of its future role in blue growth. Rev Aquacult. www.doi.org/10.1111/raq.12242

[9] FAO. 2018. The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. Rome. www.fao.org/3/I9540EN/i9540en.pdf

17. FAO published two documents and policy guidelines on spatial technologies for disaster risk management in aquaculture to ensure prevention, preparedness, response and recovery for a wide range of natural, technological and complex disasters, including climate change, that can impact aquaculture operations and livelihoods.[10,11]

18. FAO is participating in the management of risk of diseases, risk of uncontrolled spatial distribution of fish farms and risk of unsustainable use of natural resources, through identifying maximum carrying capacity, zoning and implementation of the EAA in the EU-EAC TRUE-FISH programme in Lake Victoria Basin (Kenya, Tanzania and Uganda).[12]

19. A journal article "Multi-stakeholder perspectives on spacial planning processes for mariculture in the Mediterranean and Black Sea" was published to support governance to establish activities within a coordinated spatial planning process following an EAA to counter the negative externalities of unplanned or uncoordinated development.[13] Another investigated the probable boundaries of marine growth industries in the European Atlantic, Baltic/North Sea, Mediterranean/Black Sea and the Caribbean/Gulf of Mexico.[14]

20. An EAA toolbox, similar to the EAF toolbox,[15,16] is under construction to guide users through each of the main EAA management planning steps and activities using simplified text and clear instructions. The toolbox, to be released in 2019 will also help users decide which tool(s) could be most appropriate for each step given the type of aquaculture system, their resources and technical capacity.

21. FAO has published a User-Friendly Tool for Investment Decision Making in Aquaculture (UTIDA) together with two practical training manuals as supporting documents. These training materials have been used in the business training workshops in Africa.[17]

Progress towards a programmatic approach to global aquaculture sustainability

22. FAO continues to converge major work streams towards a programmatic approach, as was recommended by the COFI-SCA in past sessions (see COFI/AQ/VII/2013/4 "Draft Strategic Framework for strengthening the role of the COFI Sub-committee on Aquaculture in Advancing Aquaculture Development" and accompanying background document COFI:AQ/2013/SBD.2 entitled "Global Aquaculture Advancement Partnership [GAAP] Programme").

23. As per this guidance, FAO continues to develop new and strengthen existing partnerships in academia, research institutions, aquaculture networks, private entities, and NGOs, as well as

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[10] Aguilar-Manjarrez, J., Wickliffe, L.C. & Dean, A., eds. 2018. Guidance on spatial technologies for disaster risk management in aquaculture. Summary version. Rome, FAO. 34 pp. www.fao.org/3/CA2659EN/ca2659en.pdf

[11] Aguilar-Manjarrez, J., Wickliffe, L.C. & Dean, A., eds. 2018. Guidance on spatial technologies for disaster risk management in aquaculture. Full document. Rome, FAO. 312 pp. www.fao.org/3/CA2240EN/ca2240en.pdf

[12] www.fao.org/africa/news/detail-news/en/c/1136374/

[13] Corner, R. A., Aguilar-Manjarrez, J., Massa, F.& Fezzardi, D. (2019) Multi-stakeholder perspectives on spatial planning processes for mariculture in the Mediterranean and Black Sea. Rev Aquacult. www.doi.org/10.1111/raq.12321

[14] van den Burg, S.W.K., Aguilar-Manjarrez, J., Jenness, J. & Torrie, M. (2019). Assessment of the geographical potential for co-use of marine space, based on operational boundaries for Blue Growth sectors. Marine Policy, Volume 100, February 2019, Pages 43–57. www.doi.org/10.1016/j.marpol.2018.10.050

[15] FAO. 2012. EAF Toolbox: the ecosystem approach to fisheries. FAO, Rome. www.fishmedia.co.za/assets/uploads/EAF-TOOLBOX-low-res-FINAL.pdf

[16] FAO 2011. EAF-Net. EAF Toolbox. FI Institutional Websites. [online]. Rome. Updated 27 May 2011. [Cited 11 June 2019]. www.fao.org/fishery/eaf-net/

[17] www.fao.org/fishery/statistics/software/utida/

Government and other partners. Forging partnerships with WFC, World Aquaculture Society or Shanghai Ocean University are just few examples of FI's increasing efforts on the important role of aquaculture in achieving the Sustainable Development Goals, noting the need for cooperation and partnerships in achieving these goals.

24. The work on the Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB - COFI:AQ/X/2019/5) and aquatic genetic resources (COFI:AQ/X/2019/4.1) are examples of FAO's and partners' efforts and support towards a global aquaculture sustainability programme. These work streams use a variety of funding mechanisms, supported by regular programme, donors, and other mechanisms.

25. FAO's work on Sustainable Aquaculture Guidelines (see COFI:AQ/X/2019/8) will provide an opportunity to act on the Sub-Committee's guidance by using a programmatic approach to analysing CCRF responses. A working group has been put in place to work on the development of Sustainable Aquaculture Guidelines. A methodology has been proposed, based on lessons learned from case studies of aquaculture developments throughout the world and existing guidance material. A first Global Expert consultation has reviewed the methodology, made improvements and provided suggestions. The outcome is being made available as an Information Document (COFI:AQ/X/2019/Inf.8) which will be presented at agenda item 9 "Special event on better management practices and guidelines for sustainable aquaculture development" of the 10th session of the COFI-SCA (COFI:AQ/X/2019/8).

26. Subject to availability of funding, further regional and subregional consultations and analyses may be conducted informing about regional needs and priority areas of intervention. Thanks to the generous assistance from the governments of Norway and Republic of Korea it has been possible to take the first steps towards the development of the SAG, and other Members and development partners are invited to contribute for facilitating a regional or subregional approach.

FAO support to aquaculture extension and capacity building

27. FAO continued its efforts supporting capacity development, in all its levels, to support the long term strengthening of inclusive extension systems through various projects.

Africa

28. Multiple regional or national business training workshops were held in Africa (Gambia, Senegal, the Republic of Guinea-Bissau and Tanzania). The workshops covered both the technical and business dimensions of fish farming.

29. In Ethiopia, FAO developed a project document on aquaculture development supported by the Triangular Cooperation project (FAO-China-Netherlands) in order to develop an aquaculture value chain in the local communities.

30. In Mozambique, the FAO Technical Cooperation Project (TCP/MOZ/3604) focusses on identifying and addressing key constraints in tilapia production development the Inhambane province, namely seed provision and application of aquaculture good practices. FAO supported small-scale family aquaculture farmers through capacity building on feed management and aquaculture. It included investigation of alternative feeds made with local ingredients and farm products, and testing as tilapia feed.

Small Island Developing States

31. FAO has continued providing support to aquaculture development in SIDS. In the Caribbean, the activities under the "Towards a Caribbean Blue Revolution" project (TCP/SLC/3601 15/II/SLC/16) included the technical training and capacity development in aquaponics to develop value chains. The "Climate Change Adaptation of the Eastern Caribbean Fisheries Sector" project (CC4FISH, GCP /SLC/202/SCF) supports the adaptation of aquaculture in seven SIDS to the impacts of climate change.

32. In Africa, the project "Adoption of efficient and climate-smart agriculture practices in African SIDS" (GCP /RAF/506/MUL) has provided technical backstopping to aquaculture development (shrimp, tilapia) in Cape Verde, within the Blue Growth Initiative. FAO is also tackling key constraints in aquaculture development, specifically for improved seed, feed and application of aquaculture good practices towards shrimp and tilapia production (UTF/CVI/047/CVI) to develop a national strategy for aquaculture and to assist partners to identify, design and specify investment needs as part of the National Investment Plan.

33. In the Pacific, the project on "Piloting subsistence aquaculture in outer islands of Tuvalu" (TCP/TUV/3702/C2) aimed to overcome technical and economic difficulties of sustaining milkfish production in remote atoll islands where costs of farm inputs are high, availability of materials low and extension support is limited. Strong community collaboration to trial cost saving solutions are investigated, including: reduced rearing times through live capture and rearing of near market size fish, feed trials for conditioning to increase fat content and reduce geosmin taint coupled with on farm training to implement and monitor results. Technical assistance to support indices of lagoon milkfish abundance and lagoon health are also being investigated. Opportunities to utilize naturally occurring milkfish conditioned to freshwater for use in aquaponics is being explored.

Mediterranean region

34. In Turkey, Algeria and Tunisia, the Blue Hope Initiative project (TCP/INT/3702) is supporting sustainable aquaculture. In particular it supports the establishment of a hatchery for aquaculture-based fisheries with locally-important species.

Europe and Central Asia

35. In Tajikistan, a TeleFood Project "Strengthening, breeding conservation and recovery of local production of Common Carp in Tajikistan" (TFD-17/TAJ/002) conducted a number of activities related to the capacity building for local small-scale fish farmers through demonstration of fish feeding technologies and creating adequate conditions for fish growing. The aim of the project is to improve fish feeding practices to raise productivity of smallholder farmers and thus the availability of affordable fish products on local markets.

36. In Kyrgyz Republic, the project GCP/KYR/012/FIN supported a carp hatchery and helped the small scale trout farmers use fertilized eggs imported from Denmark, as well as improved fish feed.

Asia and the Pacific

37. In India, the FAO/World Bank Cooperative Programme provides a technical report on fish feed issues related to supporting expansion of the culture of tilapia and pangasius, as part of the focus on aquaculture skills, capacity development, technology transfer and extension.

38. In order to improve the availability of locally made feed for small aquaculture farmers in Indonesia, FAO supported a TCP project "Supporting local feed self-sufficiency for inland aquaculture in Indonesia from 2017-2019. The project focuses on improved feed formulations and feed management strategies using locally available ingredients, with support to the enabling environment.

39. In order to improve supply of quality aquaculture seed, FAO has supported the implementation of a TCP project "Improvement of tilapia seed production and grow-out culture management in Myanmar" in Myanmar. The project strengthened capacity for production of quality tilapia seed, accessing genetically improved tilapia strain and demonstration of good practices of tilapia seed production and grow-out culture. FAO also supported the design of a multifunction marine hatchery system through implementing a TCP facility project in Sri Lanka in 2018-2019. FAO has supported a TCP project "Supporting the national technical capacity building for developing shrimp farming sector in Cambodia" from 2017-2019. The project focuses on capacity building related to shrimp seed production and health management in shrimp farming in Cambodia. In Myanmar, FAO has also collaborated with Globally Important Agricultural Heritage Systems (GIAHS) in Myanmar to identify GIAHS sites where traditional fish stocking in rice paddies is practiced.[18]

40. In Lao P.D.R., FAO has supported the diversification of rice production by implementing small fish refuges within rice fields to increase availability and access to aquatic animals and plants during the dry season, improving significantly the nutrition of small-scale producers and their communities.[19]

41. FAO has supported the capacity building in aquaculture resource mapping and planning through Information and Communication technology (ICT) based solutions in the Philippines through a TCP facility project and scaling up of innovative rice-fish and climate resilient tilapia farming in Bangladesh, Indonesia, Philippines, Sri Lanka and Viet Nam through a regional TCP project from 2017-2019.

Latin America and the Caribbean

42. In Latin America and the Caribbean the importance of bivalve aquaculture as an alternative to fish farming was discussed during a series of FAO events in the recent past as a potential food production and economic activity that could benefit small-scale coastal aquaculture producers. FAO recently published a technical manual on artificial seed production of oysters adding to FAO's portfolio of publications on bivalve seed production techniques and early spat growth.

43. In Nicaragua, FAO has been supporting the development of marine cage aquaculture on the Caribbean littoral to the benefit of Miskito indigenous communities. Some 120 indigenous fisher folk have been trained on construction and management of cages for the cultivation of two local species, and cage sites are being replicated and scaled up.

44. In Colombia, FAO has assisted the government on aquaculture development in rural communities. Pilot projects are now being replicated after sustained production increases, and after aquaculture products have entered local and regional markets. Demonstration projects included some 60 farmers and have now escalated to more than 240.

Global

45. FAO has chaired an important public-private regional offshore mariculture conference held in Singapore in 2018 highlighting the importance of technical innovations and best management practices to ensure a sustainable development of the sub-sector. The importance of information sharing and exchange of practical experiences was highlighted. Discussions have started to organize a similar event in Latin America.

46. FAO also collaborated with the International Atomic Energy Agency (IAEA) during a consultancy meeting on the project "Transfer of Natural Radionuclides in Aquaculture", to bring an

[18] www.fao.org/giahs/

[19] Sirimanotham, C., Innes-Taylor, N., Halwart, M. 2019. Promoting "aquatic diversification" of ricefield environments for food and nutrition security in the Lao People's Democratic Republic. FAO Aquaculture Newsletter, N°60, pp. 22. www.fao.org/fishery/publications/fan/

overview of the aquaculture sector, its forms, products and present output. The purpose of this consultancy was to adequately advise the Secretariat at IAEA on aquaculture, naturally-occurring radionuclides in aquaculture and fisheries products (including inputs such as feeds) and the implications for activity concentrations in the final food products.

47. FAO, in partnership with Shanghai Ocean University, organized an international workshop on the social impact of Integrated Agro-Aquaculture**.** A technical paper has been published to illustrate how bio-economic modelling can become a knowledge-intensive innovation to help tilapia farmers (or fish farmers in general) improve technical and economic performance under climate variations.[20]

48. FAO continues to provide capacity development support on aquaculture zoning through normative advice and technical guidance by providing policy, knowledge and information products as well as through direct technical assistance project interventions at regional or country levels. [21]

49. FAO participated in the EU-Interregional INTEGRATE project to support the definition of integrated multi-trophic aquaculture (IMTA), to diversify aquaculture products within a more environmental friendly production, particularly in seaweed culture.[22]

Biosecurity including Aquatic Animal Health

50. Aquaculture zoning and area management following an ecosystem approach to EAA is a useful framework to help ensure that aquaculture operations stay within the surrounding ecosystem's carrying capacity, prevent diseases and lessen conflicts over resource use.[23] Norway's zoning laws, for example, ensure that salmon producers are not overly concentrated in one area, reducing disease risk and helping mitigate environmental impacts.

51. FAO has worked with a number of biosecurity related projects, for example the project "Strengthening capacities, policies and national action plans on prudent and responsible use of antimicrobials in fisheries" (FMM/RAS/298/MUL). Many activities have been carried out under the FAO Action on antimicrobial resistance (AMR) (2016-2020). Numerous regional workshops[24] were carried out (including Aquaculture Biosecurity (China, Malaysia, the Philippines, Viet Nam) to raise awareness. FAO provided guidance in the development of the aquaculture component of country National Action Plans (NAPs) on AMR within the One Health platform and technical guidance on detailed steps in the design of antimicrobial use (AMU) and AMR survey. FAO provided policy guidance in inspection systems to include AMR in fish product sampling; fish product waste management; and utilization of fish silage (to reduce the need for antimicrobials for treatment). Communication campaigns were also carried out to aquaculture professionals/producers and the general public (though bulletins, seminars, farm visits, and social media). On governance, the project provided more explicit guidance in the development of the aquatic component to the country NAPs on AMR.

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[20] Cai, J.N., Leung, P.S., Luo, Y.J., Yuan, X.H. & Yuan, Y.M. 2018. Improving the performance of tilapia farming under climate variation: perspective from bioeconomic modelling. FAO Fisheries and Aquaculture Technical Paper No. 608. Rome, FAO

[21] Corner, R. A., Aguilar-Manjarrez, J., Massa, F.& Fezzardi, D. (2019) Multi-stakeholder perspectives on spatial planning processes for mariculture in the Mediterranean and Black Sea. Rev Aquacult. www.doi.org/10.1111/raq.12321

[22] www.integrate-imta.eu/project/

[23] Huchzermeyer, K. D. A. & Bondad-Reantaso, M. G. 2017. Biosecurity, zoning and compartments, infected zones, disease-free zones. In J. Aguilar-Manjarrez, D. Soto & R. Brummett. Aquaculture zoning, site selection and area management under the ecosystem approach to aquaculture. Full document, pp. 67–86. Report ACS113536. Rome, FAO, and World Bank Group, Washington, DC. 395pp. www.fao.org/3/a-i6992e.pdf

[24] www.fao.org/fishery/nems/40953/en; http://www.fao.org/fishery/nems/40956/en; www.fao.org/fishery/nems/41001/ar

Collection of data on antimicrobial usage and AMR was initiated based on preliminary surveillance guideline.

52. Two interregional TCP projects (TCP/INT/3501 (participated by Brasil, China, Ecuador, Indonesia, Mexico and Thailand) and TCP/IN/3502 (participated by Colombia, Ecuador, Guatemala, Honduras, India, Islamic Republic of Iran, Mexico, Panama, Peru, the Philippines and Sri Lanka), dealt with two important shrimp diseases, infectious myonecrosis virus disease (IMNVD) and acute hepatopancreatic necrosis disease (AHPND), respectively. These projects strengthened biosecurity governance and capacities to reduce and manage disease risks,[25] and one project also completed an Emergency Preparedness Response (EPR) system audit.[26]

53. FAO continued to enhance capacity/risk reduction on Tilapia lake virus (TiLV). An ongoing project, (GCP/RAF/510/MUL) "Enhancing capacity/risk reduction of emerging TiLV to African tilapia aquaculture, funded by the African Solidarity Trust Fund (ASTF) conducted its first major activity, a 10-day intensive TiLV course[27] held from 4-13 December 2018 in Kisumu, Kenya. Delegates of six participating countries (Angola, Egypt, Ghana, Kenya, Nigeria and Uganda) prepared a detailed country level implementation of their TiLV National Action Plans (NAPs), including planned diagnostics, surveillance (including field surveys and laboratory activities), information dissemination, national consultation and emergency preparedness. A TiLV Expert Knowledge Elicitation (EKE) Risk Assessment[28] was also carried out which determined the extent of biosecurity risks associated with the spread of TiLV into TiLV-free zones/countries and spread within countries where the disease is already established, and identified biosecurity measurers to manage these risks.

54. FAO's assistance on aquaculture biosecurity to the Pacific Island and Country Territories continues with a recently completed TCP facility for Palau (TCP/PLW/3601/C1: Strengthening Biosecurity Capacity of Palau) and an ongoing project for Federated States of Micronesia (TCP/MIC/3603/C2: National aquatic animal health and biosecurity strategy). The former project, implemented in 2017, achieved the following: (i) preparation of the draft Aquatic Biosecurity Regulations for Aquatic Organisms and the draft Biofouling Management Regulations; (ii) a National Consultation, that discussed the draft regulations; and (iii) the preparation of a Framework for a Biosecurity Database. All these are captured in a report[29] which also contained several lists of recommendations arising from the various project activities. The latter project has an expected output of developing a National Strategy on Aquatic Animal Health (NSAAH) and Biosecurity.

55. The project "GCP/GLO/979/NOR Improving Biosecurity Governance and Legal Framework for Efficient and Sustainable Aquaculture Production" funded by the Norwegian Agency for International Development is aimed to support countries in the sustainable development of their aquaculture industry through improving systems and practices in biosecurity, enhanced and enabling legal frameworks and promoting responsible and sustainable aquaculture practices. Four workshops were organized: (i) Second multi-stakeholder meeting on Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB) (Paris, France, 29-31 January 2019); (ii) PMP/AB Technical Working Group Meeting (Rome, Italy, 20-22 March 2019); (iii) Round-table discussion on risk based surveillance for aquatic animal diseases (using the FAO 12-point surveillance checklist for non-specialists) (Oslo, Norway, 9-10 April 2019); (iv) Round-table discussion on aquatic animal health economics (Oslo, Norway, 10-11 April 2019). A field mission to Indonesia held in May 2019 developed the surveillance design for *Enterocytozoon hepatopenaei* affecting shrimp. It is expected that the pilot testing will commence in July 2019.

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[25] www.asianfisheriessociety.org/publication/archivedetails.php?id=152&q=1; http://www.fao.org/3/a-bt131e.pdf
[26] www.fao.org/3/ca2705en/CA2705EN.pdf
[27] www.fao.org/fishery/nems/41135/zh
[28] www.fao.org/3/CA2864EN/ca2864en.pdf
[29] www.fao.org/publications/card/en/c/CA1969EN/

56. A technical workshop on the "Use of Antimicrobials in Aquaculture in Latin America: Challenges and Future Perspectives" was organized within the framework of the FAO regional project entitled "Support for the development of national action plans on antimicrobial resistance in Latin America and the Caribbean" (FMM/RLA/215/MUL). This project was designed to address the difficulties faced by countries that are in the early stages of developing their national AMR action plans in the food sector. The workshop addressed the issue of the environment, specifically water and AMR in relation to the growing regional aquaculture industry, including the shrimp, salmon and tilapia sectors. Key objective of the workshop was to sensitize the authorities and other stakeholders on the importance of the spread of antimicrobial resistance through the aquaculture environment (i.e. water) and aquaculture inputs (e.g. food) and to learn government and industry actions on containment, control and possible mitigation measures. Nine countries attended the event (Argentina, Brazil, Chile, Costa Rica, Colombia, Ecuador, Honduras, Mexico and Peru).

Aquatic Genetic Resources for aquaculture development

57. FAO has published a guideline for policy makers under the title: *Development of Aquatic Genetic Resources: Framework of Essential Criteria* which provides a baseline set of criteria to enable effective management of Aquatic Genetic Resources (AqGR). This Framework was developed in consultation with the COFI Advisory Working Group on Aquatic Genetic Resources and Technologies (COFI Advisory Working Group) and field tested and verified through regional workshops.

58. Through a German funded project (GCP/GLO/970/GER) FAO has been working towards the development of a registry of farmed types of aquatic genetic resources. An Expert Workshop is currently planned to be held at FAO in Rome, Italy, from 29 July to 1 August 2019.

59. Additional detailed information on the Report on *the State of the World's Aquatic Genetic Resources for Food and Agriculture* and follow-up actions as well as guidance sought from the COFI-SCA are provided in a separate Working Document (see COFI:AQ/X/2019/2.1).

FAO support to regional fishery bodies and aquaculture networks

60. FAO's work at regional dimension is key to sustainable fisheries management and aquaculture development, which has been demonstrated by the rapid expansion of Regional Fisheries Bodies (RFBs). In this context Regional Fishery Management Organizations (RFMOs) and Regional Fishery Advisory Bodies (RFABs) continue to evolve in response to calls for sustainability, improved management and governance, and as a result of lessons learned and stronger commitment by their members.

61. FAO has promoted and supported RFMOs and RFABs for many years. It has participated directly in the establishment of many of them, formalizing existing opportunities for sharing experiences within a given region, or implementing the processes needed for sustainable management of shared resources. These RFBs have benefited from FAO's advice on technical matters as well as its secretariat, legal, financial and process support.

62. FAO is actively committed to bolstering regional cooperation through the Regional Fishery Body Secretariats' Network (RSN)[30], which provides a forum for promoting consultation and regional dialogue, addressing priority issues of common concern and fostering ongoing cooperation and exchange of information; produce technical and communication products, such as a specific magazine[31],

[30] www.fao.org/fishery/rsn/
[31] www.fao.org/3/ca3925en/CA3925EN.pdf

and facilitates a dedicated website and other data information sources. The RSN commenced working twenty years ago with the first meeting of FAO and non- FAO RFBs, and currently counts with more than 50 members and partners; one third of these have aquaculture mandate.

63. Aquaculture is becoming a sector of increasing importance for many RFBs, due to its relevance to regional food security and nutrition, income generation and employment, and trade. In some cases the aquaculture mandate has been added more recently and was not included in the respective convention at the time the RFB was created (e.g. COPPESAALC and CIFAA), some RFB work on aquaculture despite the fact that it is not provided in their constitutive instrument.

64. The RFBs created by FAO, also members of the RSN, are eleven in number, seven of these have aquaculture in mandate, namely: the Asia-Pacific Fishery Commission (APFIC), the Central Asian and Caucasus Regional Fisheries and Aquaculture Commission (CACFish), the Commission for Small-Scale and Artisanal Fisheries and Aquaculture of Latin America and the Caribbean (COPPESAALC), the Committee on Inland Fisheries and Aquaculture in Africa (CECAF), European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC), the General Fisheries Commission for the Mediterranean (GFCM), and the Regional Commission for Fisheries (RECOFI). RFBs collaborate with regional aquaculture networks around the world, including the Aquaculture Network for Africa (ANAF), the Micronesian Association for Sustainable Aquaculture (MASA), the Network of Aquaculture Centres in Asia-Pacific (NACA), the Network of Aquaculture Centres in Central-Eastern Europe (NACEE) and the Aquaculture Network for the Americas (RAA).

65. In addition to the FAO support provided through the RSN, technical and policy support is provided in the context of projects and initiatives, in cooperation with RFBs as well as with regional aquaculture networks, such as the following:

- The project “Aquaculture Business Investment Planning and Development” (TCP/SAP/3603) aims to increase the technical capacity of the Pacific Micronesian Association for Sustainable Aquaculture (MASA) by increasing and sustaining aquaculture productivity through an enhanced aquaculture business and investment planning approach. This will be achieved by developing national aquaculture business development strategies for each country, which will go towards the development of a regional aquaculture business development strategy. At the end of the project, the regional strategy will then be presented at a regional forum to engage support from potential donors and investors.
- The CACFish project (TCP/SEC/3701) aims to improve the technical capacity of fish farmers and authorities on fish feed development in Central Asia. The recipient countries are the Republic of Azerbaijan, the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, and Uzbekistan. The regional initiative and priority area is to empower smallholders and family farms for improved rural livelihoods and poverty reduction.
- In January 2018 the 15th Session of the COPPESAALC was held in Panama. The meeting was attended by 14 Member Countries of the Commission, as well as observers from the Organization of the Fisheries and Aquaculture Sector of the Central American Isthmus (OSPESCA), and the Center for Information and Advisory Services on the Marketing of Fishery Products of the Central American Isthmus. Latin America (INFOPESCA). Considering the growing importance of fisheries and aquaculture in food production, food and nutrition security, and in poverty alleviation of poverty, the Commission recommended and prioritize a series of regional actions ranging from combating illegal fishing, supporting small-scale aquaculture development and supporting a stronger south-south cooperation environment.
- For aquaculture statistics collection capacity building among members, the FI Department has worked with member states as well as regional bodies to update the statistical standards and methodologies in accordance with internationally established norms, including the Regional Commission for Fisheries (RECOFI), Lake Victoria Fisheries Organization (LVFO) and a number of individual countries, and partner organizations.

- In the process of formalizing the Aquaculture Network for Africa (ANAF), a meeting was organized in August 2018 at AU-IBAR office in Nairobi, Kenya. The main objective of the meeting was to review the progress made by ANAF secretariat in the process of integrating the network within the African Union Inter-African Bureau for Animal Resources (AU-IBAR). The meeting made a list of options and priorities actions to be undertaken by the respective stakeholders (ANAF-MS, current ANAF-Secretariat/FAO and AU-IBAR) to facilitate the institutionalization of ANAF Secretariat into AU-IBAR. Thus, a task force composed of Cameroon, Kenya, Nigeria, Senegal and South Africa was established to oversee the implementation of the action plan. The meeting requested FAO and AU-IBAR to support the implementation of a two-year transition action plan including the facilitation of the selected task force to follow up on the key designated activities.
- In partnership with NACA and Cirad, FAO organized a special session on integrated agriculture aquaculture and agroecology during the World Aquaculture Society meeting, which encouraged the EAA, and provided inputs to FAO's work on Agroecology. FAO also supported NACA in building the organizational capacity and implementing programme activities to support the sustainable development of aquaculture development in its member countries. FAO supported and contributed to the 29th and 30th Governing Council meetings held respectively in Malé, Maldives from 26 to 28 June 2018 and in Guangzhou, China from 26 to 28 March 2019. FAO participated in the Search Committee of the new Director General of NACA and supported the final election process. FAO supported NACA to jointly organize a regional consultation on Antimicrobial Resistance associated with aquaculture in Asia-Pacific and related country case studies on 3-7 September 2018 in Bangkok.
- FAO supported the Asia-Pacific Fishery Commission (APFIC) in organizing the 7th Regional Consultative Forum Meeting in Cebu, the Philippines from 7 to 9 May 2018, the 35th Session in Cebu, the Philippines from 11 to 13 May 2018 and the 76th Session of APFIC Executive Committee in Chiang Mai, Thailand from 5 to 7 March 2019. FAO supported APFIC in organizing a regional consultative workshop on Building Climate Resilient Fisheries and Aquaculture in the Asia-Pacific Region, Bangkok, Thailand from 14 to 16 November 2017.
- FAO supported the Southeast Asia Fisheries Development Centre (SEAFDEC) through participating in its recent Governing Council Meeting and Programme Steering Committee Meeting and support its programme development.

Improving consumer perceptions of aquaculture

66. FAO is participating in a European Union-funded Horizon 2020 project entitled "Mediterranean Aquaculture Integrated Development (MedAID)".[32] The objective of MedAID is to increase the overall competitiveness and sustainability of the Mediterranean marine fish-farming sector, throughout the whole value chain. Included in FAO's contribution to the project activities are aspects related to improvement of business performance and development of strategic marketing plans of aquaculture products. In collaboration with project partners, work is underway to identify sources of information resulting in positive or negative reactions on the demand side, which may affect quantities sold and market prices. To support ongoing work within the project, in May 2018, FAO organized a workshop on "Role of mass media and aquaculture markets"[33] which gathered different stakeholders, including specialized media representatives, from the Mediterranean. FAO is also preparing of a research report on "Image transmitted in the media on aquaculture".

67. Under MedAID, FAO is also participating with the GFCM and is preparing promotional material addressing the public at large and consumers on the positive externalities of sustainable aquaculture and benefits associated with aquaculture products, according to Blue Growth principles. In

[32] www.medaid-h2020.eu
[33] www.medaid-h2020.eu/index.php/workshop-massmedia-aquaculturemarkets/

addition, within the same project GFCM is endeavouring to identify the critical factors that influence the social acceptability (SA) of aquaculture through an on-line survey and regional workshops. A first workshop "The importance of Social Acceptability for Mediterranean aquaculture development: Stocktaking and the way forward" was held in Montpellier (France) at AQUA 2018[34]. It explored the current knowledge of SA for aquaculture, and discussed also on the public's awareness of aquaculture and aquaculture products. A second workshop took place in Monastir (Tunisia) in April 2019 to identify the main provisions for preparation of guidelines to improve SA of aquaculture in the Mediterranean and the Black Sea. The Guidelines will be aimed to assist policy-makers and other relevant stakeholders in the implementation of good practices to unlock the potentiality of sustainable aquaculture and contribute to improve the general public perception of aquaculture.

OTHER AREAS

FAO's Blue Growth initiative and aquaculture

68. FAO's Blue Growth Initiative has promulgated sustainable and inclusive aquaculture management and development in many countries and a variety of fora including: FAO's Blue Hope Technical Cooperation Programme which aims to develop multi-sectoral investment plans, including on aquaculture and aquaponics, in Turkey, Algeria and Tunisia; the elaboration of a national blue economy strategy including specific aquaculture priorities in Madagascar; a blue economy dialogue in Bangladesh with particularly focus on specific targeted interventions for coastal aquaculture; Kenya's Sustainable Blue Economy conference in Nairobi including a side event on small-scale aquaculture and associated value chains.

69. FAO restructured it Regional Initiative on Blue Growth (RI-BG) in Asia-Pacific, which is now one of the five FAO Regional Initiatives for Asia and the Pacific. The new programmatic framework of the (RI-BG) covers five Main Areas of Work: i) Strengthen the enabling environment for sustainable growth of aquaculture, sustainable capture fisheries and conservation of marine and inland water ecosystems and aquatic biodiversity in Asia; ii) Support improved efficiency and sustainable growth of aquaculture in Asia; iii) Promote sustainable capture fisheries and protection of aquatic biodiversity and ecosystem services; iv) Support inclusive and equitable aquaculture and fisheries value chain development and v) Increase resilience of farmers and fishers in adapting to climate change impacts and coping with natural and socioeconomic risks. The implementation of RI-BG has a full coverage of the members in the Asia and the Pacific, where there is potential and interest.

Climate change

70. FAO has continued working on opportunities and challenges for climate change adaptation and mitigation in the aquaculture sector. A comprehensive review of climate change impacts and recommended responses has been produced in the FAO Technical Paper *Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options*, with three chapters dedicated to aquaculture: Chapter 20: Effects of climate change on aquaculture: drivers, impacts and policies; Chapter 21: Climate change and aquaculture: vulnerability and adaptation options; Chapter 22: Climate change and aquaculture: interactions with fisheries and agriculture; and several other chapters dedicated to both aquaculture and capture fisheries.[35]

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[34] www.medaid-h2020.eu/index.php/importance-social-acceptability-mediterranean-aquaculture-development/

[35] Barange, M., Bahri, T., Beveridge, M.C.M., Cochrane, K.L., Funge-Smith, S. & Poulain, F., eds. 2018. Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and

71. A new guide describing the application of spatial technology to improve disaster risk management (DRM) within the aquaculture sector, that includes climate-related risks, has been published.[36] DRM requires interrelated activities to ensure prevention, preparedness (including early warning), response and recovery for a wide range of natural, technological and complex disasters that can impact aquaculture operations and livelihoods. This guide is organized in two parts: the processes and steps for the use of spatial technology within DRM for aquaculture and selected country case studies from Bangladesh, the Gulf of Mexico and the Caribbean, and Indonesia.

72. The Fisheries and Aquaculture Training in Emergency (FARE) was piloted in the Eastern Caribbean with the overall aim to enhance national capacity to prepare and respond to emergencies affecting the fisheries and aquaculture sector. The training programme builds upon the FAO Fisheries and Aquaculture Emergency Response Guidance and the FAO Guidelines for the Fisheries and Aquaculture Sector on Damage and Needs Assessments in Emergencies. These guidance documents are the first comprehensive set of best practices to support those responding to emergencies involving the fisheries and aquaculture sector along the value chain.[37]

73. A technical paper has been published to illustrate how bio-economic modelling can become a knowledge-intensive innovation to help tilapia farmers (or fish farmers in general) improve technical and economic performance under climate variations.[38] The paper has attracted attention and collaboration from various partners, such as WorldFish, Brazilian Agricultural Research Corporation (EMBRAPA) in Brazil and the China Agriculture Research Systems – Crustaceans (CARS-Crustaceans).

Improving the socio-economic impacts of aquaculture

74. FAO continues work on improving the socio-economic impacts of aquaculture. Capacity-building activities on the aquaculture as a business approach have been provided during the intersessional period through various mechanisms, such as projects implemented under the Technical Cooperation Programme (TCP), the Government Cooperative Programme (GCP), the Africa Solidarity Trust Fund (ASTF) and FAO regular funding.

75. World Aquaculture Performance Indicators (WAPI), an FI initiative based on Agenda item 7 "Assessing and monitoring the aquaculture sector performance: importance, issues and challenges" of COFI-SCA VI (Cape Town, 2012), has started bearing fruits. As of February 2019, WAPI information and knowledge products include: (i) two formally published data analysis tools and two draft tools available for test use; (ii) seven technical papers (including, notably, one on short-term projection of fish demand-supply gaps for nearly 200 countries/territories, close to 40 regions and the entire world, and another methodology paper on understanding and measuring the contribution of aquaculture and fisheries to GDP); and (iii) five sample policy briefs (including one sector assessment prepared for backstopping a TCP in Azerbaijan). WAPI products have been disseminated and promoted at major international events (COFI 2018; IIFET 2018; AQUA 2018) and at the country level (China). Partners interested in training and/or collaboration in WAPI include IFAD, WorldFish, the Chinese Academy of

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mitigation options. FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp. www.fao.org/3/I9705EN/i9705en.pdf

[36] Aguilar-Manjarrez, J., Wickliffe, L.C. & Dean, A., eds. 2018. Guidance on spatial technologies for disaster risk management in aquaculture. Full document. Rome, FAO. 312 pp. www.fao.org/3/CA2240EN/ca2240en.pdf

[37] www.fao.org/blogs/blue-growth-blog/training-of-trainers-on-fisheries-and-aquaculture-emergencies-arpitas-story/en/

[38] Cai, J.N., Leung, P.S., Luo, Y.J., Yuan, X.H. & Yuan, Y.M. 2018. Improving the performance of tilapia farming under climate variation: perspective from bioeconomic modelling. FAO Fisheries and Aquaculture Technical Paper No. 608. Rome, FAO. www.fao.org/3/i8442en/I8442EN.pdf

Fishery Sciences, the Fisheries Commission (Ghana), and the National Aquaculture Research Development and Training Centre (Kenya).

76. Two regional training workshops on Doing Aquaculture as a Business were held in Banjul, the Republic of the Gambia, from 10 to 14 September 2018[39] and Dakar, the Republic of Senegal, from 25 to 29 June 2018.[40] Two national training workshops on Doing Aquaculture as a Business, were held in Bissau, the Republic of Guinea-Bissau, from 7 to 11 May 2018 and Zanzibar, the United Republic of Tanzania, from 23 to 26 April 2018. FAO published two key practical training manuals on doing aquaculture as a business addressing the technical and economic dimensions of commercial aquaculture.[41,42]

77. The preparation of the practical training manual on Better Management and Business Practices (BMBP) for seaweed farming communities, including integration with other aquaculture species has been initiated.

78. A consultative meeting on youth platforms and use of public–private partnerships and contract farming to promote youth employment in the aquaculture and poultry sectors, was held in Addis Ababa, the Federal Democratic Republic of Ethiopia, from 27 to 30 November 2017.[43] An FAO technical paper on contract farming and public–private partnerships in aquaculture[44] was published to present the lessons learned from four East African countries – Burundi, Kenya, Rwanda and Uganda – within the framework of the project "Promoting Agricultural Diversification to Reduce Poverty, Fight Malnutrition and enhance Youth Employment Opportunities in Eastern Africa". Partnerships in the aquaculture sector were identified and documented. Fisheries research institutes, fishermen communities' representatives and youth received training on how public–private partnerships can improve access to supply chains and markets, producing new products.

79. FI has published a report on the social and economic performance of tilapia farming in Africa [45], which covers five major tilapia farming countries in the region (Egypt, Ghana, Kenya, Nigeria and Uganda). The report has been well received and deem a key document for understanding tilapia farming in Africa. There are ongoing efforts to prepare similar report in other regions (e.g. Latin America and the Caribbean) .[46]

[39] Participants from Gambia, Ghana and Nigeria.
[40] Participants from Burkina Faso, Ivory Coast, Guinea-Bissau, Mali, Niger, Senegal and Togo.
[41] FAO. 2017. Doing aquaculture as a business for small- and medium-scale farmers. Practical training manual. Module 1: The technical dimension of commercial aquaculture, by Ana Menezes, Nathanael Hishamunda, Leonard Lovshin and Elisabetta Martone. Addis Ababa, Ethiopia; Rome, Italy. Available at: www.fao.org/3/a-i7461e.pdf
[42] Hishamunda, N., Martone, E. & Menezes, A. 2017. Practical training manual on commercial aquaculture for small- and medium-scale farmers. Module 2: The economic dimension of commercial aquaculture. Addis Ababa; Rome, FAO. 26 pp. Available at: www.fao.org/3/a-i7798e.pdf
[43] The meeting was attended by delegates from Burundi, Djibouti, Ethiopia, Kenya, Rwanda, Somalia, South Sudan and Uganda), Intergovernmental Authority on Development (IGAD) and the African Union-Interafrican Bureau for Animal Resources (AU-IBAR).
[44] Murekezi, P., Menezes, A. & Ridler, N. 2018. Contract farming and public–private partnerships in aquaculture. Lessons learned from East African countries. FAO Fisheries and Aquaculture Technical Paper No. 623. Rome, Italy. Available at: www.fao.org/3/CA0134EN/ca0134en.pdf
[45] www.fao.org/3/a-i7258e.pdf
[46] FAO. 2017. Social and economic performance of tilapia farming in Africa, edited by J. Cai, K.K. Quagrainie and N. Hishamunda. FAO Fisheries and Aquaculture Circular No. 1130. Rome, Italy. Available at: www.fao.org/3/a-i7258e.pdf

GUIDANCE SOUGHT

80. The Sub-Committee is invited to:

- Review and comment on the information and background documents pertaining to FAO Fisheries and Aquaculture Department's efforts in implementing the recommendations of the past sessions of the COFI Sub-Committee on Aquaculture;
- Reflect on the progress and achievements and provide advice, as required, to strengthen and prioritize the recommendations in the next inter-sessional period; and
- Request Members and interested donors to provide financial and/or human resources to implement the priority areas in regards to aquaculture, as considered important by the Sub-Committee.