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COMMITTEE ON FISHERIES

SUB-COMMITTEE ON AQUACULTURE

Eleventh Session

24–27 May 2022

UPDATES ON IMPROVING AQUACULTURE THROUGH A PROGRESSIVE MANAGEMENT PATHWAY (PMP/AB)

Executive Summary

This Information Document provides detailed information on actions taken and progress achieved relating to the recommendations and decisions reached during the Tenth Session of the COFI Sub-Committee on Aquaculture held in Trondheim, Norway from 23 to 27 August 2019, specifically ongoing progress and future activities regarding the Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB) and which were specified in paragraphs 35 to 41 in its Report.

Members are encouraged to consider this Information Document as a supplement to COFI:AQ/XI/2022/2, specifically paragraphs 25 to 35, and provide comments and recommendations, and explore opportunities for collaboration in order to support healthy and safe aquatic foods for the much needed aquatic protein for a growing world population.

1. This Information Document was prepared for the Eleventh Session of the COFI Sub-Committee on Aquaculture.

2. This Information Document presents the actions and progress made pertaining to the recommendations of the Tenth Session of the Sub-Committee, and particularly on the recent initiative called Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB) that was welcomed and endorsed during the Tenth Session of the Sub-Committee, specifically its further development and improved understanding as occurred during the intersessional period. This paper is organized around and makes specific reference to individual paragraphs (para) of the Report of the Tenth Session of the Sub-Committee on Aquaculture, provided as COFI:AQ/XI/2022/INF.5.

3. **On para 33**, where the Sub-Committee recommended COFI consider the development, as part of FAO's global aquaculture sustainability programme, of a multi-donor assisted long-term component on aquaculture biosecurity that includes the five pillars proposed in paragraph 42 of the document:

- The programme proposal document is being finalized and contains a theory of change model which focusses on five pillars, namely:

    1) strengthening disease prevention at farm level through responsible fish farming (including reducing antimicrobial resistance (AMR) in aquaculture and application of suitable alternatives to antimicrobials) and other science-based and technology-proven measures;
    2) improving aquaculture biosecurity governance through implementing PMP/AB, enhancing interpretation and implementation of international standards and strengthening the One Health approach by bringing together state and non-state (producers and value chain stakeholders) actors; international and regional organizations; and research, academic, donor and financial institutions to design and implement mandated biosecurity measures;
    3) expanding understanding of aquaculture health economics (burden and investments);
    4) enhancing emergency preparedness (early warning and forecasting tools, early detection, early response) at all levels; and
    5) actively supporting pillars 1 to 4 with several cross-cutting issues (for example, capacity and competence development, disease intelligence and risk communication, education and extension, targeted research and development and innovation).

- The pathway to completing the process includes the following steps: submission of the programme proposal document through the FAO's Field Programme Management Information System and FAO's project cycle. The programme proposal document contains the three major sections on relevance, feasibility, and sustainability, and the required supporting annexes (including the logical framework, stakeholder engagement matrix, work plan, and risk management). The document will not contain a detailed budget but only an indicative budget. It also contains a theory of change.

- This work supports FAO's new strategic framework (2022–2025) on Better Production to ensure sustainable consumption and production patterns, through inclusive food and agriculture supply chains at local, regional and global level, ensuring resilient and sustainable and agri-food systems in a changing climate and environment. The relevant Programme Priority Area (PPA) is primarily One Health that addresses the increasing losses to production and adverse health effects caused by the spread of biological threats, including zoonotic infections of pandemic potential and antimicrobial resistance (AMR) in the crop, animal and aquaculture sectors and the Sustainable Development Goal targets: (1) 1.5 – building the resilience of the poor and those in vulnerable situations and reducing their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters; (2) 3.d – strengthening the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks; and (3) 15.8 – introducing measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority.

- As soon as the necessary FAO approval procedures have been completed, the document will be passed on to the Resource Mobilization and Private Sector Partnership Division (PSR) for guidance in approaching potential donors.

4. **On para 34**, where the Sub-Committee encouraged commitment on resource mobilization towards this programme:

- FAO secured funding to support the development of a programme proposal document through two projects funded by the Norwegian Agency for Development Cooperation (Norad), namely: GCP/GLO/979/NOR: Improving Biosecurity and Legal Framework for Efficient and Sustainable Aquaculture Production (subsequently referred to as Project 979) and GCP/GLO/352/NOR: Responsible use of fisheries and aquaculture resources for sustainable development Component 3 (subsequently referred to as Project 352). The initial preparation of the programme proposal document was partially funded by Project 979 (which ended in June 2021) and the process for completion is being funded through Project 352.

5. **On para 35,** where the Sub-Committee emphasized the need to take into consideration the World Organisation for Animal Health (OIE) standards and tools when applying the PMP/AB programme:

- The OIE standards are well captured in the PMP/AB. In addition, the OIE standards are also one of the five pillars of the proposal aquaculture biosecurity programme, in other words, enhancing interpretation and implementation of international standards.

6. **On para 36**, where the Sub-Committee stressed the importance of microbiome studies and the need for developing microbial management protocols as part of Good Aquaculture Practices:

- Not much progress has been achieved regarding microbial management protocols. However, the subject has been included as one of the salient sections 'Microbial Management at Production Levels' of the thematic review on Biosecurity: reducing the burden of disease, which was presented during the Global Conference on Aquaculture Millennium +20.[1]

7. **On para 37**, where the Sub-Committee recommended developing the PMP/AB by species group such as: finfish, molluscs, crustaceans, aquatic plants, etc.:

- This recommendation is well within the concepts, principles and application of PMP/AB, in that it is commodity-based. The application of PMP/AB to shrimp and seaweeds are captured in two publications: one in press[2] and one in preparation.[3]

8. **On para 38,** where the Sub-Committee requested the formation of an FAO Technical Working Group (TWG) to develop the PMP/AB and associated tools and mechanisms, such as: governance, centres for collaboration, assessment tools, surveillance checklists, biosecurity action plans, risk analyses, and guidance on public-private partnership, and additionally requested enhanced collaboration with relevant international bodies, such as OIE, International Plant Protection Convention, International

[1] www.aquaculture2020.org/uploads/gca-tr6-biosecurity-reducing-the-burden-of-disease.pdf
[2] Chapter 17: The progressive management pathway for improving aquaculture biosecurity (PMP/AB): Relevance and potential application to the shrimp aquaculture sector in The Shrimp Book (Editor: Victoria Alday; Authors: Melba G. Bondad-Reantaso, Brett MacKinnon, Hao Bin, Melissa McLaws and Huang Jie)
[3] A new Progressive Management Pathway for improving seaweed biosecurity: Authors: Elizabeth J. Cottier-Cook, Jennefe P. Cabarubias, Janina Brakel, Juliet Brodie, Alejandro H. Buschmann, Iona Campbell, Alan T. Critchley, Chad Hewitt, Jie Huang, Anicia Q. Hurtado, Cicilia S.B. Kambey, Phaik Eem Lim, Tao Liu, Jonalyn P. Mateo, Flower E. Msuya, Zizhong Qi, Louise Shaxson, Grant D. Stentiford, Melba G. Bondad-Reantaso

Center for Exploration of the Seas, Consultative Group on International Agricultural Research and the World Bank:

- The formal PMP/AB TWG was established in December 2019. The current members of the PMP/AB TWG are Victoria Alday (Chairperson, National Aquaculture Group, Saudi Arabia), Edgar Brun (Norwegian Veterinary Institute [NVI]), Supranee Chinabut (retired, Thailand), Elizabeth Cottier-Cook (Scottish Association for Marine Science, United Kingdom of Great Britain and Northern Ireland), Alicia Gallardo (Subpesca, Chile), Jie Huang (Network of Aquaculture Centres in Asia-Pacific, Thailand), Stian Johnsen (World Organisation for Animal Health [OIE], France), Mark Lawrence (Mississippi State University, United States of America), Brett MacKinnon (City University of Hong Kong, China SAR), Sharon McGladdery (retired, Canada), Rohana Subasinghe (retired, Sri Lanka) and Birgit Van Tongelen (European Union). FAO and NVI serve as the TWG Secretariat.

- The PMP/AB TWG focused on developing the PMP/AB guidance application, as well as a number of "toolkits". The PMP/AB guidance for application consists of the following sections: rationale, vision, mission, scope and goals. The technical sections include the following: advancement to the PMP/AB through four scenario entry points, stage descriptions, checklists and preliminary "toolkits" guidance documents, i.e. (i) conducting a gap analysis, (ii) developing a national biosecurity (or aquatic health) strategy at the national level; (iii) developing a national aquatic pathogen list, and (iv) sector-level risk and value chain analysis. The toolkit on designing and implementing an active surveillance for diseases of aquatic organisms is under the risk-based surveillance theme.

- In February 2022, the TWG was reconvened with adjustments in membership and terms of reference. It is expected that a 2022 work plan will be prepared and a first physical meeting is being planned.

- Sub-TWGs that will deal with subject-specific PMP/AB tools will be organized.

- The OIE and the World Bank have been strong partners in the PMP/AB development since its inception in 2018. Collaboration with OIE continues up to present.

9. **On para 39**, where the Sub-Committee urged Members to initiate a pilot PMP/AB programme so that lessons learned and gaps identified can provide feedback and serve as references for improvement of the PMP/AB:

- Initial work on pilot testing of the PMP/AB commenced for the following countries: Indonesia and Viet Nam. The scoping work includes completing the FAO self-assessment survey on performance and capacity on health management and biosecurity that has now been updated to be within the context of PMP/AB.

- With the finalization of the PMP/AB Guidance for Application document, the next steps include: (1) preparation of detailed practical step-wise application, (2) training of trainers for PMP/AB pilot testing proponents.

- Several countries are lined up for the PMP/AB pilot tests, including: Bangladesh (Mississippi State University and United States Agency for International Development Fish Innovation Lab); Egypt, specifically on assessment, gap analysis, and a national strategy (FAO); several countries in Nile River delta: namely, Burundi, the Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, the United Republic of Tanzania and Uganda (EU-funded TRUE FISH project implemented by FAO [component on aquatic animal health]); Malawi and Namibia (FAO project); an Asia regional strategy (FAO and the Network of Aquaculture Centres in Asia-Pacific); and in several Gulf countries (planned under FAO Regional Fisheries Commission).

- Details of several recently completed and ongoing projects that will explore pilot testing of PMP/AB are provided below:

    1) TCP/EGY/3705: Enhancing biosecurity governance to support sustainable aquaculture production in Egypt;
    2) TCP/NAM/3804/C4: TCPF: Development of National Aquatic Health and Biosecurity Strategy for Namibia;
    3) TCP/MLW/3804: Enhancing capacity to respond and manage the risk of Epizootic Ulcerative Syndrome (EUS) in Malawi;
    4) UTF/ZAM/077/ZAM: Technical Assistance to the Zambia Aquaculture Enterprise Development;
    5) TCP/ETH/3805: Technical assistance to strengthening fish disease diagnosis. surveillance and monitoring capacity;
    6) GCP/GLO/352/NOR: Responsible use of fisheries and aquaculture resources for sustainable development;
    7) GCP /RAF/519/EU-EAC True Fish Farming Story in Lake Victoria Basin (TRUE-FISH);
    8) GCP/GLO/086/ROK: Smart and Sustainable Aquaculture though Effective Biosecurity and Digital Technology.

- Feedback on the lessons learned and gaps will be provided during the next sessions of the Sub-Committee.

10. **On para 40**, where the Sub-Committee recognized the importance of developing an assessment tool on aquaculture health economics and emergency preparedness, aligning with the initiatives of Global Burden of Animal Diseases, which could support decision makers (at policy, production and service provider levels) in ensuring effective resource allocation and creating an environment for increased investment opportunities:

- Five discussion papers were prepared, namely:

    1) Populations and Production Systems – identifying global aquaculture population, production and post-production systems;
    2) Production Loss and Expenditure;
    3) Animal Health Ontology and Attribution;
    4) Wider Economic Impacts Evaluating the Wider Economic Effects of Negative Production Impacts in Aquaculture;
    5) Informatics – Aquaculture Data Management and Governance Strategy.

- The second accomplishment under this activity involved the development of a preliminary framework and guidance for analysing and quantifying the costs and benefits of aquatic biosecurity and disease control, an important aspect for decision-makers – whether policy-makers or producers – in terms of prioritizing where to put their resources. “Costs” represent the economic, monetary and non-monetary losses (or expenditure) for private producers, governments and the society at large that result from the negative impact of disease or pathogens upon aquaculture production. Similarly, “benefits” represent all the economic monetary and non-monetary gains (or profit) that can be harnessed from the implementation of such biosecurity or disease control measures at farm, sectoral or societal level. The overall aim of the exercise was to engage with stakeholders and co-develop guidance and analytical tools that might shine a light on the costs and benefits associated with different biosecurity and disease control options, inform decisions and support improved policies. It is envisioned that there will be four progressive phases to this work, namely:

        a. Phase I: Presentation of key economic principles and development of an analytical

framework and guidance comprehending the costs and benefits of aquatic biosecurity and disease control.

b. Phase II: Application of the framework to four case studies.
    - Case study 1: The production of specific pathogen-free shrimp (example from Saudi Arabia) – private sector-led;
    - Case study 2: An outbreak of white spot syndrome virus in shrimp farms (example from Madagascar) – private sector-led;
    - Case study 3: A national aquatic disease surveillance programme (example from India) – government-led;
    - Case study 4: An emergency response to an outbreak of tilapia lake virus in tilapia farms (example from the Philippines) – government-led.
c. Phase III: Lessons learned and procedure for rolling out the guidance to other case studies, pilots and/or countries.
d. Phase IV: Evaluation for upscaling and policy implications in specific countries.

- All of the above are being supported by Project 979 and Project 352.

11. **On para 41**, where the Sub-Committee recommended improving PMP/AB communication streams, with focus on governments, inter-governmental organizations (fisheries and aquaculture authorities, veterinary services, food safety agencies), farmers, industry, investors, and other interested parties:

- Annex 1 provides information on the various PMP/AB-related publications released in 2019 until present, those in press and in preparation as well as events where PMP/AB was presented.
- In addition, as recommended by the PMP/AB TWG, a paper on PMP/AB is being developed to be published in a peer reviewed journal.
- Articles about PMP/AB are also being planned to be submitted to other communication portals, for example industry magazines, for wider dissemination.

Annex 1: Relevant PMP/AB communication stream (as of March 2022)

N	Title of publication/Link
PMP/AB-related reports	
1	FAO. 2020. *Progress towards development of the progressive management pathway for improving aquaculture biosecurity (PMP/AB): Highlights of 2019 activities.* FAO Fisheries and Aquaculture Circular No. 1211. Rome. www.fao.org/documents/card/en/c/cb0560en
2	FAO. 2020. *Report of the Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB): First Technical Working Group Meeting, Rome, 20–22 March 2019*. FAO Fisheries and Aquaculture Report No. 1322. Rome. https://doi.org/10.4060/cb0582en http://www.fao.org/documents/card/en/c/cb0582en
3	FAO. 2020. *Report of the Second Multi-Stakeholder Consultation on the Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB). Paris, France, 29-31 January 2019*. FAO Fisheries and Aquaculture Report No. 1321, Rome. www.fao.org/documents/card/en/c/cb0745en
4	FAO. 2020. *The State of World Fisheries and Aquaculture 2020. Sustainability in action*. Rome. Aquaculture biosecurity: Disease Emergence and the Progressive Management Pathway, pages 190-192 www.fao.org/documents/card/en/c/ca9229en
5	Tenth Session of the COFI Sub-Committee on Aquaculture: COFI:AQ/X/2019/5 Working Document: Preventing and managing aquatic animal diseases risks in aquaculture through a progressive management pathway (August 2019) www.fao.org/3/na265en/na265en.pdf
6	FAO. 2019. *Report of the FAO/MSU/WB First Multi-Stakeholder Consultation on a Progressive Management Pathway to Improve Aquaculture Biosecurity (PMP/AB), Washington, D.C., United States of America, 10–12 April 2018*. FAO Fisheries and Aquaculture Report No. 1254. Rome. 76 pp. www.fao.org/documents/card/en/c/ca4891en/
PMP/AB-related tools (e.g. disease strategy manuals, surveillance, guidance documents, national strategy, risk analysis, emergency preparedness, including AMR, etc.)	
7	Tang, K.F.J., Bondad-Reantaso, M.G., Surachetpong, W., Dong, H.T., Fejzic, N., Wang, Q., Wajsbrot, N. & Hao, B. 2021. *Tilapia lake virus disease strategy manual*. FAO Fisheries and Aquaculture Circular No. 1220. Rome, FAO. www.fao.org/publications/card/en/c/CB7293EN/
8	Bondad-Reantaso, M.G., Fejzic, N. MacKinnon, B., Huchzermeyer, D., Seric-Haracic, S., Mardones, F.O., Mohan, C.V., Taylor, N., Jansen, M.D., Tavornpanich, S., Hao, B., Huang, J., Leaño, E.M., Li, Q., Liang, Y., Dall'occo, A. 2021. A 12-point checklist for surveillance of diseases of aquatic organisms: a novel approach to assist multidisciplinary teams in developing countries. *Reviews in Aquaculture*: 1-19. https://onlinelibrary.wiley.com/doi/10.1111/raq.12530
9	FAO. 2020. *What you need to know about epizootic ulcerative syndrome (EUS) – An extension brochure for Africa*. Rome. www.fao.org/documents/card/en/c/cb1645en/
10	Tang, K.F.J., Bondad-Reantaso, M.G., Arthur, J.R., MacKinnon, B., Hao, B., Alday-Sanz, V., Liang, Y. & Dong, X. 2020. *Shrimp acute hepatopancreatic necrosis disease strategy manual*. FAO Fisheries and Aquaculture Circular No. 1190. Rome. FAO. www.fao.org/documents/card/en/c/cb2119en/
11	FAO. 2020. *Report of the FAO Expert Working Group Meeting "Scoping Exercise to Increase the Understanding of Risks of Antimicrobial Resistance (AMR) in Aquaculture", Palermo, Italy, 26–29 November 2018*. FAO Fisheries and Aquaculture Report No. 1268. Rome. www.fao.org/documents/card/en/c/ca7442en/

12	Bondad-Reantaso, M.G. Lavilla-Pitogo, C., Lopez, M.A., Bin, H. 2020. *Guidance in Development of Aquaculture Component of a National Action Plan on Antimicrobial Resistance*. Asian Fisheries Science 33.S1 (2020):119–124 www.asianfisheriessociety.org/publication/abstract.php?id=1334
13	Smith, P. 2019. *The performance of antimicrobial susceptibility testing programmes relevant to aquaculture and aquaculture products*. FAO Fisheries and Aquaculture Circular No. 1191. Rome, FAO. www.fao.org/documents/card/en/c/ca6028en/
14	Tang, K.F.J., Bondad-Reantaso, M.G. & Arthur, J.R. 2019. *Shrimp infectious myonecrosis strategy manual*. FAO Fisheries and Aquaculture Circular No. 1187. Rome, FAO. www.fao.org/documents/card/en/c/ca6052en/
15	Food and Agriculture Organization of the United Nations (FAO). 2018. *Tilapia Lake Virus Expert Knowledge Elicitation Risk Assessment (December 2018)*. FAO Animal Health Risk Analysis – Assessment, Issue No. 7. Rome, FAO. www.fao.org/publications/card/en/c/CA2864EN/
	In preparation: • FAO. 2022. *The Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB): Guidelines for Application*. • FAO. 2022. Disease strategy manuals: Epizootic ulcerative syndrome (EUS), White spot disease of shrimp (WSD); Decapod iridescent virus 1 (DIV1) • FAO. 2022. *Contingency planning for mass mortality events in aquatic populations: guidance on effective preparedness, response, recovery and review* • FAO. 2022. *Responsible management of bacterial diseases in aquaculture* • FAO. 2022. *Diagnostic guide to diseases of aquatic organisms*
	In preparation: Journal to be identified. 2022. A new Progressive Management Pathway for improving seaweed biosecurity. Authors: Elizabeth J. Cottier-Cook, Jennefe P. Cabarubias, Janina Brakel, Juliet Brodie, Alejandro H. Buschmann, Iona Campbell, Alan T. Critchley, Chad Hewitt, Jie Huang, Anicia Q. Hurtado, Cicilia S.B. Kambey, Phaik Eem Lim, Tao Liu, Jonalyn P. Mateo, Flower E. Msuya, Zizhong Qi, Louise Shaxson, Grant D. Stentiford, Melba G. Bondad-Reantaso
	In press: Chapter 17: *The progressive management pathway for improving aquaculture biosecurity (PMP/AB): Relevance and potential application to the shrimp aquaculture sector*. In: The Shrimp Book (Editor: Victoria Alday; Authors: Melba G. Bondad-Reantaso, Brett MacKinnon, Hao Bin, Melissa McLaws and Huang Jie)