NETWORK OF AQUACULTURE CENTRES IN ASIA-PACIFIC

Twentieth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health

REPORT OF THE MEETING

Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand

4-5 November 2021

Prepared by the NACA Secretariat

Preparation of this document:

This report was prepared by the 20th Asia Regional Advisory Group on Aquatic Animal Health (AG) who met virtually in Bangkok, Thailand on 4-5 November 2021.

The Advisory Group was established by the Governing Council of the Network of Aquaculture Centres in Asia-Pacific (NACA) in 2001 to provide advice to NACA members in the Asia-Pacific region on aquatic animal health management, through the following activities: (a) evaluate disease trends and emerging threats in the region; (b) identify developments with global aquatic animal disease issues and standards of importance to the region; (c) review and evaluate the Quarterly Aquatic Animal Disease reporting programme and assess the list of diseases of regional concern; (d) provide guidance and leadership on regional strategies to improving management of aquatic animal health including those under the framework of the Asia Regional Technical Guidelines; (e) monitor and evaluate progress on Technical Guidelines implementation; (f) facilitate coordination and communication of progress on regional aquatic animal health programmes; (g) advise in identification and designation of regional aquatic animal health resources, as Regional Resource Experts (RRE), Regional Resource Centres (RRC) and Regional Reference Laboratories (RRL); and (h) identify issues of relevance to the region that require depth review and propose appropriate actions needed. Members of the Advisory Group include invited aquatic animal disease experts in the region, representatives of the World Animal Health Organisation (OIE) and the Food and Agricultural Organization of the United Nations (FAO), collaborating regional organisations such as SEAFDEC Aquaculture Department (SEAFDEC AQD) and OIE-Regional Representation in Asia and the Pacific (OIE-RRAP), and the private sector.

Reference: NACA 2021. Twentieth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health: Report of the Meeting. Published by the Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand.

ABBREVIATIONS AND ACRONYMS

AAD	Aquatic animal disease
AAH	Aquatic animal health
AAHRDD	Aquatic Animal Health Research and Development Division, Department of Fisheries, Thailand
AAHSC	Aquatic Animal Health Standards Commission of the OIE
AG	Asia Regional Advisory Group on Aquatic Animal Health (NACA)
AGM	Advisory Group Meeting
AHPND	Acute hepatopancreatic necrosis disease
AMR	Antimicrobial resistance
AMU	Antimicrobial use/usage
AP	Asia-Pacific
CA	Competent authority
CEV	Carp edema virus
CN	Concept note
COAG	Committee on Agriculture (FAO)
COFI/SCA	Committee on Fisheries, Sub-Committee on Aquaculture (FAO)
COVID-19	Corona virus disease 2019
CQIV	*Cherax quadricarinatus* iridescent virus
DIV1	Decapod iridescent virus 1
EHP	Hepatopancreatic microporidiosis caused by *Enterocytozoon hepatopenaei*
EUS	Epizootic ulcerative syndrome (Infection with *Aphanomyces invadans*)
FAO (HQ)	Food and Agricultural Organization of the United Nations (Headquarters)
GS	General Session of the OIE Delegates
ICTV	International Committee on Taxonomy of Viruses
IHHNV	Infectious hypodermal and haematopoietic necrosis virus
IHNV	Infectious haematopoietic necrosis virus
IMN	Infectious myonecrosis
IMNV	Infectious myonecrosis virus
ISAV	Infectious salmon anaemia virus
KHV	Koi herpesvirus
LMBV	Largemouth bass virus
MrNV	*Macrobrachium rosenbergii* nodavirus
MrGV	*Macrobrachium rosenbergii* golda virus
MSU	Mississippi State University
NAAHS	National Aquatic Animal Health Strategy
NACA	Network of Aquaculture Centres in Asia-Pacific
NHP	Necrotising hepatopancreatitis
NSAAH	National strategy for aquatic animal health
NVI	Norwegian Veterinary Institute
OIE	World Organisation for Animal Health
OIE PVS	OIE Performance of Veterinary Services (tool)
OIE-RRAP	OIE Regional Representation in Asia and the Pacific, Tokyo, Japan
PCR	Polymerase chain reaction
PL	Post larvae
PMP/AB	Progressive management pathway for improving aquaculture biosecurity
PT	Proficiency testing
QAAD	Quarterly Aquatic Animal Disease
RL	Regional laboratories (OIE)
SDDV	Scale drop disease virus

SEAFDEC-AQD	Southeast Asian Fisheries Development Center, Aquaculture Department
SPF	Specific pathogen free
SHIV	Shrimp hemocyte iridescent virus
SVCV	Spring viraemia of carp virus
TG	Technical Guidelines (Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals)
TiLV	Tilapia lake virus
TiPV	Tilapia parvovirus
TWG	Technical working group
USAID	United States Agency of International Development
VCMD	Viral covert mortality disease
VHS	Viral haemorrhagic septicaemia
VHSV	Viral haemorrhagic septicaemia virus
VNN	Viral nervous necrosis
WAHIS	World Animal Health Information System
WSD	White spot disease
YHV	Yellow head virus
YSFRI	Yellow Sea Fisheries Research Institute, P.R. China

The 20th Asia Regional Advisory Group on Aquatic Animal Health.

Participants of the virtual AGM 20 composed of AG members and co-opted members from FAO (Rome, Italy), OIE HQ (Paris, France), OIE-RRAP (Tokyo, Japan), OIE-AAHSC (Paris, France), SEAFDEC AQD (Iloilo, Philippines), AAHRDD (Bangkok, Thailand), P.R. China, Australia, Singapore, Thailand, the private sectors (PHARMAQ, Inve), NVI (Ås, Norway), and NACA Secretariat. Observers from NACA member countries and territories were also invited, and governments represented include: Australia, Bangladesh, Cambodia, Hong Kong SAR, India, Indonesia, Malaysia, Philippines, Thailand and Vietnam. Additional observers from OIE-RRAP, Japan and R.O. Korea also participated.

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OPENING SESSION

The 20th Meeting of the Asia Regional Advisory Group on Aquatic Animal Health (AGM-20) was convened in Bangkok, Thailand on the 4-5 November 2021. Due to the continuing travel restrictions brought by the COVID-19 pandemic, AGM 20 was again held virtually via Zoom platform. Originally attended by only AG members, co-opted members and few observers, the meeting was again participated by NACA member country representatives, as well as additional observers from partner organisations and other countries in the region. NACA member countries and territories represented include Bangladesh, Cambodia, Hong Kong SAR, India, Indonesia, Malaysia, Philippines, Thailand, and Vietnam. Additional observers were from Japan, R.O. Korea, and OIE-RRAP.

The meeting was opened by **Dr. Eduardo Leaño**, Senior Programme Officer of NACA and Technical Secretary of the AG. Welcome message was given by **Dr. Jie Huang**, Director General of NACA. After brief self-introduction by all the participants, **Dr. Jing Wang** (Vice-Chairperson) took over in facilitating the meeting. Due to the virtual nature of this year's meeting, the topics covered were also limited to few important updates and issues on aquatic animal health as shown in the meeting agenda (**Annex A**) which was adopted without amendment. The complete list of participants is attached as **Annex B**.

SESSION 1: PROGRESS REPORT FROM NACA'S ASIA REGIONAL AQUATIC ANIMAL HEALTH PROGRAMME

Dr. Eduardo Leaño presented the progress report of NACA's Asia Regional Aquatic Animal Health Programme since the previous AGM 19 which was held virtually on 26-27 November 2020. Key points discussed during the AGM 19 include:

- Disease surveillance and reporting: continued surveillance for emerging diseases and biosecurity enhancements should be emphasized; and, sharing of information to create awareness so that the industry and regulators can actively take risk management measures.
- OIE standards and notification: AP countries should continue to be actively engaged in the development of OIE standards, and comply with their obligations to notify the occurrence of listed and emerging diseases.
- National programmes on AAH: national aquatic animal health strategies of the member countries should be further strengthened; and, success stories of countries in the region in dealing with disease emergencies and disease prevention should be highlighted. This would help other countries to avoid the pitfall of disease burden.
- Regional Collaboration Framework: AP countries should fully support the Regional Collaboration Framework on AAH to further strengthen aquatic animal health management in the region through implementation of important projects that have been proposed through the Framework; and, involvement of the national laboratories in the Framework will facilitate sharing of expertise and resources (e.g. provision of positive samples for emerging diseases).
- Emerging diseases: create an information system for emerging pathogens that might be distributed widely through some modern technologies like "WeChat" or other online platforms; capacity and awareness on aquaculture biosecurity should be pushed forward and its

implementation promoted, especially at the farm level; and, promotion of environment-friendly or more sustainable aquaculture systems in order to prevent pathogens from creating future disease problems.

Report of the meeting (e-copy) was widely circulated among NACA member countries and partner organizations, and published at NACA website for free download.

Two QAAD Reports were published covering the 3rd and 4th quarters of 2020. From January 2021, a new aquatic animal disease (AAD) reporting format was co-implemented by NACA and OIE-RRAP as endorsed by the 19th AG. All Members in the AP region are now invited to submit monthly data, as soon as available, to OIE RRAP and NACA with their OIE Delegate in copy to ensure the timeliness of the disease information. The new AAD monthly reporting will be a rolling report containing all the disease information from January of each year. All submitted reports are published and available for download at a dedicated page in both the NACA and the OIE-RRAP websites.

In support of the OIE Regional Collaboration Framework, NACA has implemented a project on the "Collection and Evaluation of Existing Guidelines and Awareness Materials on Aquaculture Biosecurity for Small-scale Farms in the Asia-Pacific Region" in January 2021. Important regulations and other relevant information on aquaculture biosecurity (national and farm levels) were collected from nine countries including Australia, Bangladesh, PR China, India, Indonesia, Malaysia, New Zealand, Thailand and Vietnam. All collected documents were individually assessed based on biosecurity risk analysis, record keeping, training, management measures to reduce disease transmission, emergency procedures, monitoring and audit, disease reporting, diagnostic tests, and control measures after disease outbreak.

As recommended during the previous AGM, NACA has organized an Online Consultation on Strategies for Hepatopancreatic Microsporidiosis caused by *Enterocytozoon hepatopenaei* (EHP) in February 2021. The consultation aimed to discuss the current status of EHP in the region; and, to present recent innovations and currently recommended strategies of control (including information to give confidence that EHP cannot be spread via chilled or frozen export products prepared and packaged for human consumption). Renowned experts from the region as well as country representatives from PR China, India, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam were invited to present important topics on EHP, from its history to diagnostics to farm experiences and management.

NACA also got involved in important OIE activities including memberships in two *Ad Hoc* groups (Codification of Animal Diseases and Technical References for Aquatic Animals), and participation in the aquatic animal health session of the 32nd Conference of the OIE Regional Commission for Asia, the Far East and Oceania. NACA has continued to collaborate with partner organizations (ASEAN, OIE-RRAP and FAO-RAP) on important activities in AMU and AMR in the region through webinars, consultations and online training.

In collaboration with the Yellow Sea Fisheries Research Institute (YSFRI), online training courses were organized on aquaculture biosecurity (Second Training Course on Mariculture Technology for the Asia-Pacific Region: Aquaculture Biosecurity) and mariculture technologies (Maritime Silk Road

Training Course on Mariculture Technology). These training courses were attended by around 200 participants from around the world.

DISCUSSION

- There is always a need to focus resources on some important issues, thus, a strategic plan (which was recommended by the AG during the previous meetings) is important for NACA. The group was informed that a new strategic plan is being prepared by NACA in all its thematic programmes (including aquatic animal health), and this will be presented during the online Governing Council Meeting for
- On aquaculture AMR, with the many regional activities being undertaken led by key organisations including ASEAN, FAO and OIE wherein NACA is collaborating or participating, gaps have already been identified including the problem on interpretation of results from the AMR activities being undertaken by the different countries in the region. As such, the finalisation of the Regional Guidelines for AMR Surveillance in Aquaculture, being prepared by Singapore as lead country for AMR in the ASEAN, is being looked forward to as this will serve as a harmonized guidelines/protocols to follow in undertaking AMR surveillance in aquaculture in the region
- Without the regional guidelines, each country is still doing what they have been doing for AMR surveillance among bacterial pathogens in aquaculture. Although there has been initiatives prior to focus more on specific pathogens, the laboratory procedures used for AMR surveillance are different from country to country and there is no standard to compare the results that are generated.
- There is a need to start coordinated efforts, especially among laboratories, in setting standards which goes through the CLSI procedure, and needs a lot of isolates in order to validate specific cut-off values. If a few laboratories will work together, the required number of isolates can easily be met in order to set standard values.
- FAO-RAP is facilitating a project on bulk-order of specifically-designed microplates for AMR surveillance, with pre-set standards of different antibiotics for important pathogens of animals, including aquatic animals. NACA is currently on discussion with the project leader (Dr. Mary Joy Gordoncillo) on how get some of the countries involved in this AMR surveillance project using the prepared microplates for determining AMR in aquatic pathogens. Using such procedure, the data that will be gathered by the participating countries will be easily analysed and compared.
- One of the big challenges is how to precisely monitor the volume of antibiotics used by the farms, especially when there are many potential routes that they can be acquired. One of the key steps in capturing such data is the guidelines being prepared by FAO-RAP and OIE on antimicrobial use at the farm level. The first draft is now internally finalized and circulated to the experts for the second round of comments especially for contributions from aquatic/aquaculture side which is at present very limited.
- AMU and AMR is still a big but an important issue in aquaculture in the region, and with all the activities going on, the region is getting somewhere little by little which is a good scenario that can be looked at, despite the many challenges.

RECOMMENDATIONS

- AG recommended NACA to continue its important aquatic animal health management works in the region in collaboration with partner organisations, especially on current issues like AMU/AMR, biosecurity and emerging diseases.
- AG recommended that member governments should continue to support important projects on AAH that are being implemented and planned for the region.

SESSION 2: UPDATES FROM OIE AQUATIC ANIMAL HEALTH STANDARDS COMMISSION

Dr. Ingo Ernst gave a presentation on the progress of the Aquatic Animal Health Standards Commission's (AAHSC) work to develop new and revised standards for the OIE Aquatic Animal Health Code and OIE Manual of Diagnostic Tests of Aquatic Animals. Dr. Ernst advised that since the 2020 NACA AG meeting, the AAHSC had met virtually in February 2021 and September 2021. The OIE General Session was held virtually in May 2021.

Dr. Ernst highlighted some of the key standards adopted at the OIE General Session in May 2021 and ongoing work discussed at the Commission's September 2021 meeting.

For the OIE Aquatic Code, key standards adopted in May 2021 included:

- Listing of Decapod iridovirus 1
- A new chapter on biosecurity for aquaculture establishments
- Revision of the lists of susceptible species for:
    - Spring viraemia of carp virus (SVCV)
    - Viral haemorrhagic septicaemia virus (VHSV)
    - *Bonamia ostreae*

For the OIE Aquatic Manual, key standards adopted in May 2021 included:

- Substantial revisions of diagnostic chapters for fish diseases:
    - 2.3.0 General information (diseases of fish)
    - 2.3.3 Infection with *Gyrodactylus salaris*
    - 2.3.5 Infection with infectious haematopoietic necrosis virus
    - 2.3.8 Infection with salmonid alphavirus
    - 2.3.9 Infection with spring viraemia of carp virus
    - 2.3.10 Infection with viral haemorrhagic septicaemia virus
- A new chapter for an amphibian disease:
    - 2.1.2. Infection with *Batrachochytrium salamandrivorans*

For the Commission's ongoing work, Dr Ernst highlighted some of the key activities that may be of most interest to members.

Listed diseases. The Commission considered the report of its ad hoc group on tilapia lake virus. The ad hoc group had evaluated available diagnostic methods for TiLV and had recommended that reliable diagnostic methods are available. The Commission agreed that TiLV now meets the listing criteria of the Aquatic Code and agreed that it should be proposed for listing.

Safe commodities. Each disease-specific chapter of the Aquatic Code includes an article (article X.X.3) that lists commodities considered safe for trade without any disease specific measures. Some members have commented that the recommendations appear inconsistent, particularly with regard to thermal treatment. The Commission has proposed a revised structure to this article to improve clarity and has presented draft revised articles for all fish and crustacean diseases.

Approaches for self-declaration of freedom. The Commission has considered revised approaches to claiming and maintaining freedom from listed diseases. The suggested approaches have been developed through consultation with member countries on a discussion paper prepared by the commission. The changes are intended to improve the practicality and flexibility of approaches to claiming freedom whilst also maintaining confidence in their rigour.

Revised articles for disease specific chapters have been developed and provided to members for comment. In addition, a substantially revised Chapter 1.4 on surveillance has been further refined following consideration of member comments.

Aquatic Code chapter for DIV1. Following the listing of DIV1 in May 2021, a new aquatic code chapter for this disease has been developed and provided to members for comment.

Aquatic Manual. The Commission is continuing to progressively update the scientific information in all Aquatic Manual chapters and to reformat them into a new template. The revised chapters have clear guidance on recommended tests for surveillance, information on their validation status, consistent case definitions, and updated scientific information. Four substantially revised fish disease chapters have been provided to members for comment. These include:

- 2.3.2. Infection with epizootic haematopoietic necrosis virus
- 2.3.4. Infection with HPR-deleted or HPR0 infectious salmon anaemia virus
- 2.3.6. Infection with koi herpesvirus
- 2.3.7. Infection with red sea bream iridoviral disease.

The Commission also considered comments on its discussion paper on eDNA methods. The commission revised the paper based on member country comments and, following another round of comment and revision, will finalise the paper and make it available on the OIE website.

DISCUSSION

- For listing of TiLV in the OIE Aquatic Code, it is expected that some member countries may be reluctant to have it listed. However, the decision to list the disease should be based on assessment against the listing criteria and the benefit of disease measures implemented broadly across the globe. There is still an expectation that many countries remain free from TiLV.

- TiLV is now being reported in several countries, thus listing it in OIE will still be useful because its target species is tilapia which is now globally commoditized. This means that there is a lot of trading going on for its genetic materials. Listing of TiLV can be an advantage for global trade through the development of consistent standards to support trade of tilapia commodities.
- In general, disease reporting is still an issue for aquatic animal diseases in the region, and the importance of transparency and reporting of emerging diseases is again highlighted in the presentation, especially in establishing trust among trading partners.

RECOMMENDATION

- AG recommended that countries to continue disease reporting to OIE and NACA as this will facilitate transparency which is important for international trade of aquatic animals and aquatic animal products.

SESSION 3: AQUACULTURE BIOSECURITY

3.1 THE PROGRESSIVE MANAGEMENT PATHWAY FOR IMPROVING AQUACULTURE BIOSECURITY (PMP/AB): UPDATE FROM NOVEMBER 2020 PRESENTATION; ACTIVITIES OF RELEVANCE TO ASIA

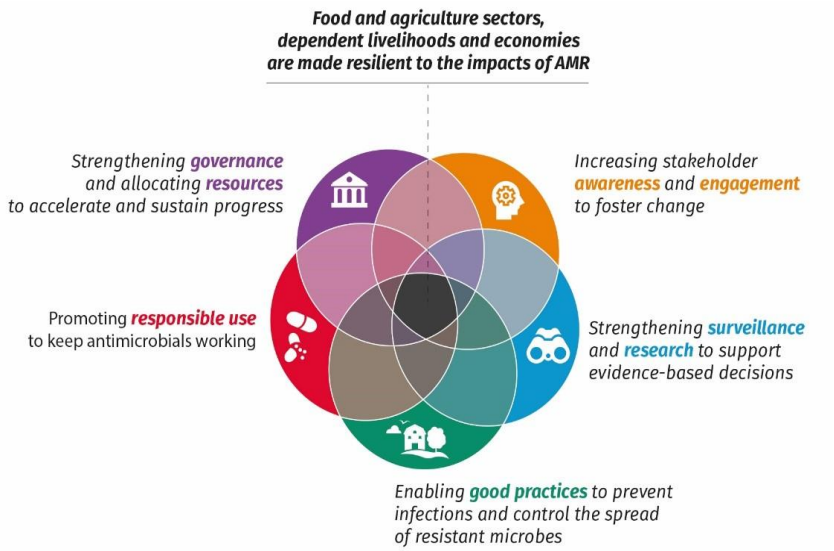
Dr. Bin Hao (on behalf of Dr. Melba Reantaso) presented updates regarding the Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB) from the November 2020 presentation (AGM-19) and other activities of relevance to Asia.

The meeting was reinformed of salient aspects from the FAO Committee on Fisheries Sub-Committee on Aquaculture 11th session (COFI SCA11) held in Trondheim in August 2021 which endorsed and welcomed the PMP/AB and supported the development of an Aquaculture Biosecurity Programme and its five pillars. With respect to PMP/AB, the Sub-Committee requested the formation of a Technical Working Group, pilot testing of PMP/AB and improving its communication stream.

Ongoing activities pertinent to the abovementioned pillars are listed below.

PILLAR 1: Strengthening disease prevention at farm level through responsible fish farming (including reducing AMR in aquaculture and the application of suitable alternatives to antimicrobials) and other science-based and technology-proven measures

- Launched of the FAO Action Plan on Antimicrobial Resistance (AMR) 2021-2025 (with five key objectives) after approval by the FAO Council (166th Session, April 2021) – after passing through Committee on Agriculture (COAG, 27th Session, Sep-Oct 2020) and COFI (34th Session, February 2021)



- Establishment of FAO candidate reference centers on Aquaculture Biosecurity and AMR through a rigorous process for selection and designation of the Center: 26 applicants, 13 candidates passed the evaluation process by a Selection Panel; 3 candidates passed the final evaluation and are:
    - China: two institutions from Chinese Academy of Fisheries Science: Yellow Sea Fisheries Research Institute and Pearl River Fisheries Research Institute
    - India: Nitte University
    - United States of America: Mississippi State University (MSU)

The process of designation consists of 6 steps. Currently the process is in step 4 - government endorsement.

- Publication "Monitoring and Surveillance of AMR in bacteria from aquaculture" part of the Regional AMR Monitoring and Surveillance Guidelines Vol. 3, is being finalsed based on a regional consultation on AMR risk to aquaculture in Asia held in Bangkok in 2018 in collaboration with participating countries and NACA followed by several rounds of discussion and revisions. This activity is being funded by USAID and implemented by FAO Regional Office for Asia-Pacific.
- Virtual AMR Webinars: 13-14 April, and 13-15 December 2021 with speakers from about 20 countries including China, India, the Philippines, Singapore, Thailand and Asia with nearly 500 participants (https://www.fao.org/fishery/nems/41307/en). The latter was in collaboration with the above-mentioned FAO reference centers.
- TCP/RAS/3702: "Support mitigation of Antimicrobial Resistance (AMR) risk associated with aquaculture in Asia" with India, Indonesia, Viet Nam as recipient countries, enhancednational laboratory capacity for effective surveillance and monitoring of AMR associated with aquaculture; a dedicated training on AMR surveillance and monitoring for the three countries carried out in July 2021 (http://infofish.org/APFIC/index.php/amr-training) and a series of virtual events (2021 APFIC webinar series) on "Antimicrobial resistance is simple to understand, yet it is often misunderstood" with more than 200 participants.

PILLAR 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 actors (producers, value chain stakeholders), international and regional organizations, research, academia, donor and financial institutions to design and implement mandated biosecurity measures. Activities under this pillar are being supported by different projects as listed below:

- GCP/GLO/979/NO: (started 1 January 2019 until 31 Dec 2021) focussed on:
    - PMP/AB guidance documents
    - EHP active surveillance in Indonesia
    - Initial stages of PMP/AB assessment: China, Indonesia, Viet Nam
- TCP/INT/3707 funded by FAO testing the PMP/AB toolkit (12-point surveillance checklist) in Colombia, Philippines, Viet Nam.
- GCP/GLO/086/ROK funded by Government of South Korea has Output 3 dedicated to PMP/AB; recipient country is Viet Nam; a second country in Asia is being explored.
- The virtual event Fish-Vet Dialogue 1 in partnership with OIE and NVI, held in June 2021, entitled " Exploring Collaboration on Managing Health of Aquatic Organisms" had nearly 150 participants from more than 30 countries, including Bangladesh, China, Indonesia, Republic of Korea, the Philippines, Thailand, Viet Nam in Asia; and NACA joined as observer.
- The webinar on Aquaculture Biosecurity intended for Latin America and the Caribbean held in June 2021 generated more than 600 participants including Asian attendees

PILLAR 3: Expanding understanding of aquaculture health economics (burdens and investments, opportunity cost). Under this pillar, include the following activities:

- GCP/GLO/352/NOR, under this project and continuing from GCP/GLO/979/NOR, activities include the development of a framework and guidance for costs and benefit analysis (CBA) of aquatic biosecurity systems, with the following initial case studies: Case study 1: The production of Specific Pathogen-Free (SPF) shrimp (e.g. Saudi Arabia) – private-sector led.
- Case study 2: An outbreak of white spot syndrome virus (WSSV) in shrimp farms (e.g. Madagascar) – private-sector led.
- Case study 3: A national aquatic disease surveillance programme (e.g. India). – government-led.
- Case study 4: An emergency response to an outbreak of Tilapia Lake Virus (TLV) in tilapia farms (e.g. Philippines) – government-led

PILLAR 4: Enhancing emergency preparedness (e.g. early warning and forecasting tools, early detection, early response) at all levels. Under this pillar, include the following activities:

- GCP/GLO/352: Work on this is continuing which is expected to produce a Decision-Tree manual for dealing with mass mortality events and disease outbreaks in aquatic populations.
- A number of disease strategy manuals (technical element of a contingency plan and component of emergency preparedness), namely:
    - IMNV: https://www.fao.org/documents/card/en/c/ca6052en/

- AHPND: https://www.fao.org/documents/card/en/c/cb2119en/
- TiLV: https://www.fao.org/publications/card/en/c/CB7293EN/

Two major global virtual events that were successfully implemented include:

(1) Global Conference in Aquaculture 2020, held in September 2021, include a thematic review paper on biosecurity led by Victoria Alday and Huang Jie with at least 70 contributors https://aquaculture2020.org/uploads/gca-tr6-biosecurity-reducing-the-burden-of-disease.pdf

(2) Tilapia health: *quo vadis,* held in December 2021, in collaboration with Infofish http://infofish.org/tilapia/index.php?

The next activities to be carried out in the year 2022 and 2023 are listed below:

- Continuous implementation of relevant projects
- PMP/AB TWG: 3 members of the PMP/AB Technical Working Group will be from Asia.
- Development of PMP/AB toolkits: risk assessment, emergency preparedness, disease burden, disease strategy manuals
- PMP/AB pilot testing as well as capacity building activities implemented through different projects:
  - Bangladesh (USAID funded Fish Innovation Lab implemented by the MSU)
  - China: self- funding
  - Indonesia and several Asian countries (in collaboration with NACA, project GCP/GLO/352/NOR)
  - Viet Nam: through project GCP/GLO/086/ROK
- Fish/Vet Dialogue 2
- Regional and international collaboration: continue existing collaboration
  - New collaboration: World Bank/OIE/FAO
- PMP/AB-related publications
  - PMP/AB guidance application, policy paper, value risk assessment guidance
  - Shrimp Book II: Chapter 17: The PMP/AB: relevance and potential application to the shrimp aquaculture sector
  - A Progressive Management Pathway to Assist National and International Developments in Biosecurity for the Seaweed Aquaculture Sector
- Review papers:
  - Review of alternatives to antibiotic use in aquaculture
  - Antimicrobial resistance in aquaculture: a global analysis of literature and national action plans

DISCUSSION

- Work programs of PMP/AB in PR China is very useful for the overall aquatic animal health management. In 2021, China participated in the pilot work of the PMP/AB with FAO. The national aquatic animal health self-assessment was completed and the national aquatic animal pathogen list drafted.
- Many scientific research institutes in P.R. China have formulated the technical measures for biosecurity management at farm level. Some standards were also established and practical experiences in the application of biosecurity in shrimp hatchery and aquaculture farms were collected. Booklets and other extension materials were also prepared to introduce biosecurity technologies and to make it easier for the farmers to understand.
- Quarantine of seeds of shrimps and crustaceans is also being undertaken at the farm level which is very important for prevention of diseases. Early prevention also involves health and nutrition of broodstock.
- As in AMR, the steps taken by each country in the region in the implementation of aquaculture biosecurity will surely contribute a lot in the overall aquatic animal health management.

RECOMMENDATIONS

- AG recommended that more countries in the region should actively participate and collaborate in the different activities related to PMP/AB, especially for the projects that will be implemented by FAO in the future.
- AG recommended that other countries in the region should follow what P.R. China has done so far, especially on farm-level biosecurity, which will definitely contribute to better aquatic animal health management and disease prevention.

3.2 A SYSTEMATIC APPROACH FOR QUANTIFYING BIOSECURITY MEASURES IN AQUACULTURE

Dr. Saraya Tavornpanich presented a quantitative biosecurity assessment tool developed by the Norwegian Veterinary Institute (NVI). Diseases are the major constraints in aquaculture, and biosecurity is critical for sustainable development of aquaculture. This work emphasizes how biosecurity measures and their relative importance can be quantified and documented in an objective way. The system approaches internal and external biosecurity in a general manner, focusing on transmission routes shared by numerous different types of infectious agents. Norwegian veterinary institute worked with research institutes and farmers from Croatia, Egypt, France, Greece, Italy, Spain, Tunisia, Turkey to estimate biosecurity risk associated with disease introduction and spread into seabass and seabream farms in 8 different countries surrounding the

Mediterranean basin (Tavornpanich et al., 2020)[1]. The same approach has been tested for Atlantic salmon farms in Norway. This quantitative system helps to identify gaps and weaknesses in the biosecurity plan, assists farmers to allocate resources and tailor the biosecurity programme to fit the risk profile of their farms. If the system is applied in region it also helps to compare a specific farm with an average of the biosecurity scores obtained by neighbouring farms, so that the owners can benchmark their biosecurity and evaluate the risk profile of the region. This benchmarking may give owners impelling reason to improve their farm biosecurity. The system can be modified to fit various farm production characteristics (e.g. RAS), different exposures (e.g. antibiotics), and for different disease agents. This system is developed to be a farmer self-assessment tool with a user friendly automated dashboard containing the functionalities, so that the farmers interested in an objective evaluation of farm or regional biosecurity can have a secure access of their own information.

DISCUSSION

- This kind of assessment tool is very useful because numbers are easy to interpret with regard to the biosecurity measures being implemented in the farm.
- In the system's dashboard, information on biosecurity measures, standards and recommendations for each of the measures, as well as the questions and the farm scores are included, which can be used by the farmers as reference in case of low scores that are obtained for specific biosecurity criteria.
- On Mediterranean and Norwegian case studies, there are similarities as both cases are culturing two species (seabass and seabream) in both land-based and off-shore cages. However, farm management are different and moreover for the Mediterranean case, it is composed of several countries, thus requires translation of the questions into the local language. And since these countries are sharing the same area for aquaculture operations, other factors are added for biosecurity assessment in consideration of such condition.
- Language barrier is one of the challenges in getting first-hand information from the farmers themselves, thus translation of the questions into the local language is very important.
- Most management protocols are standardized in the assessment tool including introduction of live feeds, use of formulated feeds, water management, waste management, and movement of animals and equipment among others. However, implementation of each measure is very different from country to country. For example in Norway, the use of live feed is not allowed, whereas in the Mediterranean, farmers often use live feeds.
- The assessment tool covers a couple of different issues including benchmarking and operationalisation of biosecurity at the farm level. Validating the measures in the questionnaires which is production system- and country- specific depending on circumstances.

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- One possible issue in answering the questionnaire, being a self-assessment tool, is the honesty of the respondents. There are, however, several ways to validate this and one is by sending back and forth the same questionnaire to verify whether the self-reporting is actually accurate. It should also be relayed to the farmers that being honest will be for their own benefits.
- The assessment tool with continue to keep on developing through time, and publication of results will be one of the outputs. NVI is looking forward for future collaborations in this regard.
- The tool is so simple and logical and can be used in many ways, not just on the individual farm level but at national or regional levels as well.
- This tool is still on the research stage and not yet on the implementation stage with funding from the Norwegian Research Council and NVI. In order to make this sustainable, there is a need for more people participation and for the relevant authorities to see the relevance of the tool. Currently, NVI is working with multiple stakeholders in the country to review on how the questionnaires were prepared and assessed, apply for more funding, and aims for the adoption of the tool application for actual usage at the farm level.
- The present tool is designed for monoculture system, and making it applicable for polyculture system will require additional parameters.
- Setting up of standards for the minimum biosecurity requirements for a particular production system will also be done for the finalization of the assessment tool.
- OIE has published a standard on aquaculture biosecurity, and it would be good if this can be validated in particular production system or to have some generic approach to allow self-evaluation of biosecurity plans and practices against the international standards. This could be a giant leap forward for aquatic animal health in general.
- This tool is definitely worth to try in the Asia-Pacific region considering the more complex aquaculture systems, wherein there might be a need to add additional biosecurity measures/standards for the farm-level biosecurity assessment.

RECOMMENDATIONS

- AG recommended to continue discussion with NVI on possible collaboration and involvement of some major aquaculture-producing countries in the Asia-Pacific region during the research phase and finalization of the aquaculture biosecurity assessment tool. This is considering the more complex conditions in Asian aquaculture including various culture species, culture systems, culture environments, and farm management strategies.
- AG recommended that the tool, once finalized, should be used for farm-level biosecurity assessment in line with the self-assessment requirement under the PMP/AB.

SESSION 4: OIE AQUATIC ANIMAL HEALTH STRATEGY

Dr. Stian Johnsen gave a presentation on the OIE Aquatic Animal Health Strategy which was launched at the 88th General Session in May 2022. Work on the Strategy was initiated by the OIE

Director General, Dr Monique Éloit, at the OIE Global Conference on Aquatic Animal Health held in April 2019 in Chile.

There is a strong need for this new strategy given that humans eat more aquatic animals than ever - world per capita fish consumption is double that of the 1960s; more aquatic animals are farmed than ever - half of all fish for human consumption is grown in aquaculture; and more aquatic animals are traded than ever - the value of seafood exports has more than doubled in the last 10 years. Yet, aquatic animal diseases threaten the sustainable growth of the aquaculture sector and, consequently, our food supply. This threat is shared and therefore requires collaborative actions by the OIE and its Members, in collaboration with relevant stakeholders, to protect and improve aquatic animal health worldwide. The strategy will be important to improve aquatic animal health and welfare worldwide, contributing to sustainable economic growth, poverty alleviation and food security, thereby supporting the achievement of the UN Sustainable Development Goals.

The Strategy was developed by the OIE Secretariat in cooperation with the Aquatic Animals Commission. Member Countries and partners were asked to contribute to its content by providing their views through a survey on: what OIE initiatives they consider the most valuably to them; the biggest opportunities to improve aquatic animal health an welfare the next 5-10 years; and what they consider to be the biggest threats to a sustainable growth in aquatic animal health productions.

The Strategy has three main outcomes:

Outcome 1. Competent Authorities have improved aquatic animal health management in place, supporting increased aquatic animal production and reduced disease risk.

Outcome 2. Regions are supported to collaborate on aquatic animal health issues of common concern, improving the overall health, productivity and resilience of the region.

Outcome 3. The OIE provides global leadership and in partnership with the OIE Community, builds a stronger and more resilient global aquatic animal health system.

This Strategy addresses FOUR OBJECTIVES: STANDARDS, CAPACITY BUILDING, RESILIENCE and LEADERSHIP. Specific activities that are designed to help achieve each objective and improve aquatic animal health are identified. Each objective includes the related activities, their rationale and approach.

Objective 1 – STANDARDS: addresses the development of new standards and the revision of existing standards, and their implementation. The activities undertaken to meet this objective aim to ensure OIE aquatic standards are scientifically sound and fit for purpose, and that Members are supported to engage in the standard-setting process and implement standards.

Objective 2 – CAPACITY BUILDING: the activities undertaken to achieve this objective will support Members to strengthen their Aquatic Animal Health Services, regardless of the level of development of those services. The activities will address areas such as improving utilisation of the OIE PVS Pathway, increasing transparency in disease reporting, supporting professionals, and enhancing disease management in small-scale aquaculture.

Objective 3 – RESILIENCE: the activities undertaken to achieve this objective will support Members on early detection and rapid response to disease outbreaks of regional or global concern, and prevention of transboundary spread of disease. Antimicrobial resistance (AMR) and insufficient access to appropriate and effective veterinary medicinal products is also addressed under this objective.

Objective 4 – LEADERSHIP: through this objective, the OIE will continue to build its capacity to lead efforts to meet these challenges into the future. Under this objective, five areas will be targeted to strengthen the OIE's capability to provide this leadership. The focus will be to further develop international partnerships and engagements of scientific networks.

The key to success is for the whole OIE organisation to commit and to build on our strengths. As a first step of implementing the activities, cross-organisational teams for each activity have been established. The next step will be to actively engage the OIE Community: OIE Members and their private sectors, OIE Reference Laboratories and Collaborating Centres and international partners.

Many of the activities will be implemented first at regional level to test the effect. The OIE Asia and the Pacific Region is currently the leading star of the OIE in the coordination and implementation of regional activities to improve aquatic animal health and welfare through the establishment of a Regional Collaboration Framework. They have established regional Flagship activities on: Collection and Evaluation of Existing Guidelines and Awareness Materials on Aquaculture Biosecurity for Small-scale Farms in the Asia-Pacific Region; Collection and Evaluation of Existing Test Methods for Acute hepatopancreatic necrosis disease (AHPND); and Regional collaboration to respond to emerging diseases of aquatic animal.

The OIE aims for our Regional and Sub-Regional Representations to have a closer relationship and learn from each other. The intention is for the other OIE regions to establish similar collaboration frameworks to that of Asia and the Pacific in their regions.

The OIE strongly encourages you and the whole OIE Community to take active part in the implementation of the Strategy.

DISCUSSION

- With the newly launched OIE AAH Strategy, it is crucial to receive feedbacks from member countries so that OIE can identify what will not work and know the needs of the country especially in terms of support from OIE. All of the inputs will be gathered by OIE and probably rethink some of the activities before going too far in the implementation of the Strategy.
- The Strategy is important especially for countries with already existing and implementing national AAH strategy to look into how it is aligned with the OIE AAH Strategy.
- It is observed that the major barrier for disease reporting is in the proposition of trade ban by some countries even if a particular disease is already present (e.g. Infection with WSSV). This was experienced recently by India which received trade bans because of the presence of WSSV which is present in almost throughout the world.

- There are several aspects on this issue: one is the consequences of notifying diseases which is meant to prevent spread but it can also be used as a (unjustified) trade barrier (as experienced by India on WSSV); another is defining safe commodities and doing risk assessment. At the moment, the OIE-AAHSC is working on amending the parts of the disease specific chapters on safe commodities, sent to the delegates for comments, and the official report will be published on the OIE website once completed.
- Also, there is a substantial difference in how the diseases and susceptible species are addressed between the aquatic animal species and the terrestrial species. On the aquatic side, the presence of a pathogenic agent is usually being notified to the OIE while on the terrestrial species, some can still declare a free zone despite the presence of a pathogenic agent in different susceptible species within the same zone.
- It is emphasized that it is very important for the members and experts to get involved in the OIE international standard setting process, thus any scientific evidence or comments that should be shared can be coursed through the OIE Delegate who will then submit those to the OIE for consideration.
- On establishing laboratory networks, it will be easier for laboratories and experts to join such kind of OIE laboratory diagnostic networks rather than being an OIE Reference Laboratory. This is a very interesting concept and highly relevant to the region as there is a possibility to establish a small satellite laboratory doing training project and improve each others' capacity even without going through ISO certifications (e.g. university laboratories). This is the way to go at this time especially that there is not enough OIE Reference Laboratories, to have these networks closer including collaborating centres which will be an easier way to better engage people and expertise.
- On the issue of safe commodity (for human consumption), the safety of aquafeed and its trade shall also be considered as biosecurity should be done right at the start of any production line where concern is not only focussed on the cultured animals but also all the other inputs into the production system. OIE encourages members to have a look at all the documents circulated for comments, so that the Commission can act on such in their February meeting.
- On eDNA surveillance on aquatics, it has been used in many places but on limited number of diseases. It is relevant for the aquatics, and there is a guidance document being prepared by the Commission on how to approach it. So far, it has been included in the chapter on Gyro., but not all the chapters will be including eDNA at the moment not because it's not possible but due to the lack of methodologies, but it will definitely be included in disease-specific chapters of the Manual.
- The report of the Commission is already made available to the Delegate website, and OIE encourages members read it, since a great part of the report is on Chapter 1.4 on Disease Surveillance. The Commission has taken great amount of time in re-writing the whole chapter to make it usable for the members. It has become a really good chapter and relevant when talking about disease freedom and status, as well as issues relating to trade. Once the report is translated to French and Spanish (which is on-going), it will be made available on the OIE website.

- Dr. Ingo Ernst will give a webinar on the Commission Report for all the delegates and focal points by the end of November.

RECOMMENDATIONS

- AG recommended that country members and experts should actively get involved in the OIE international standard setting process.
- AG recommended that countries in the region should promote the OIE AAH Strategy in line with their respective NAAHS for better aquatic animal health management and consequently prevention of disease outbreaks.

SESSION 5: UPDATES ON OIE REGIONAL COLLABORATION FRAMEWORK ON AQUATIC ANIMAL HEALTH

Dr. Jing Wang gave a presentation on the activities of the Regional Collaboration Framework on Aquatic Animal Health and its background and key objectives. In the OIE Expert Consultation Meeting on Aquatic Animal Disease Diagnosis and Control held in November 2018 in Bangkok (Thailand), it was proposed to establish the Regional Collaboration Framework on Aquatic Animal Health in Asia and the Pacific (hereinafter referred to as "the Framework"), which would initially focus on building a framework of actors to strengthen laboratory capacity for aquatic animal disease activities in Asia and the Pacific such as emergency responses to disease outbreaks. It also intended to contribute to improved information sharing among OIE Reference Centres and OIE Member Countries regarding aquatic animal health issues. This proposal was further discussed and endorsed by the Regional Commission for Asia, the Far East and Oceania in its 31st Conference held in Sendai, Japan, in September 2019.

The 1st meeting of the ad hoc Steering Committee was organised in November 2019 to share information regarding planned activities and capacities of OIE RLs, identify interests amongst OIE RLs and Members as well as to discuss the activities and objective of the Framework. During the 1st meeting the following three projects were identified as priority activities for 2021.

- Collection and Evaluation of Existing Guidelines and Awareness Materials on Aquaculture Biosecurity for Small-scale Farms in the Asia-Pacific Region; OIE in collaboration with NACA
- Collection and Evaluation of Existing Test Methods for Acute hepatopancreatic necrosis disease (AHPND); in collaboration with Dr Grace Lo, OIE designated expert for AHPND
- Regional collaboration to respond to emerging diseases of aquatic animals; in collaboration with Dr Ingo Ernst, the president of OIE Aquatic Animal Health Standard Commission

The 2nd meeting of ad hoc steering committee of the Framework discussed the ongoing projects and approved two projects CN. In the coming 3rd meeting the group will: 1) review implementation of the flagship activities; 2) share challenges and gaps on aquatic animal health management in the region amongst OIE designated experts and OIE Members. 3) discuss and identify potential projects the Framework could address in 2022 onwards.

Besides the three flagship projects, the OIE regional representation for Asia and the Pacific also organized several other events that target the priority areas that the ad hoc steering committee identified. These events include: Responsible and prudent antimicrobial use (AMU) in aquatic animals in Asia and the Pacific (Nov 2020), OIE Virtual Consultation Meeting on Antimicrobial Resistance and Antimicrobial Use in Aquaculture (June 2021); OIE PVS Aquatic: Virtual Information Session for Asia and the Pacific (Nov 2021).

Jing Wang also presented the new regional aquatic animal disease reporting system which replaced the QAAD report since January 2021. The report can be access through: https://rr-asia.oie.int/en/projects/regional-aquatic-animal-disease-report-from-2021/

DISCUSSION

- Countries in the region as well as partner organizations should continue to support this initiative of the OIE-RRAP as aquatic animal health management is very important for the aquaculture industry especially in the Asia-Pacific which is the biggest producer of aquaculture products in the world.
- Country feedbacks on current issues on aquatic animal health will guide the Collaboration Framework in planning for future projects to address such issues.
- On PVS, there has been regional-level training undertaken by OIE in 2019, which include PVS Aquatic. PVS-orientation training is normally quite a long meeting which include a lot of practical exercises, thus it is usually a face-to-face training. For the support from the RRAP it includes in-country or regional orientation training, self-evaluation or guidance on the preparation of requirements for requesting PVS mission, or developing some awareness materials.
- PVS is important for the region because OIE provides external evaluation of the members and the report can be used as a strong tool to lobby with high level officials to attract more investment and get more funding from the central government. External evaluation can also provide a more neutral suggestions or guidance to the members to help them improve their system.
- Before the PVS training, there should be a sort of an in-country orientation training or webinar about the different aquatic veterinary services that will be evaluated under the PVS aquatic. Many people are not aware of what these “services” mean, which are actually national veterinary services including work force intended for the aquatic industry as a whole. In OIE, there has been some internal discussion to make sure that the aquatic animal health services are covered under all the OIE core activities especially the work force project.
- Aquatic animal health services under the PVS mission do not only cover disease diagnosis, prevention and control or the use of chemicals, but also all other industries (feeds, processing and even education) that are connected to the aquaculture industry in general, and on how aquatic animal health management is being implemented under a broader view including diseases, biosecurity, seed sources and post-harvest among others.

RECOMMENDATIONS

- AG recommended that AP countries as well as partner organisations should continue to support the Framework, especially the specific projects that are currently being implemented.
- AG recommended that member countries should continue to update the Framework on some of the important issues on AAH management that need to be addressed.
- AG recommended that countries in the region, especially major aquaculture producers, should avail of the OIE PVS Aquatic as a self-assessment of all aquatic veterinary services in the country. Assistance will be continuously provided by OIE from the application process to the implementation.

SESSION 6: UPDATES ON QAAD REPORTING AND DISEASE LIST

6.1. Dr. Eduardo Leaño presented the status of QAAD Reporting in the Asia-Pacific region. A total of 90 QAAD reports were published since its inception way back in 1998 until the 4th quarter of 2020, where e-copies of the report are published at both NACA and OIE-RRAP websites. As of 5 November 2021, website downloads (NACA website) for the 3rd and 4th quarter reports were 667 and 679, respectively.

From January 2021, a new aquatic animal disease (AAD) reporting was implemented as endorsed by the 19th AG. All Members are now invited to submit all the monthly data as soon as available to OIE RRAP and NACA with their OIE Delegate in copy, to ensure the timeliness of the disease information. The new monthly reporting is a "rolling report" containing all the disease information from January of each year (in every report that is submitted), and will be immediately published in dedicated pages at both NACA and OIE-RRAP websites. In lieu of the QAAD Reports, NACA has published quarterly news article on AAD reporting, and from October 2021, reported aquatic animal diseases (based on submitted reports) will also be published on quarterly basis

Percentage of member countries and territories submitting the report is still a concern. With the new disease reporting format, only 10 out of the 32 member countries and territories (30%) submitted at least one report for the period covered. Countries and territories submitting the monthly disease report include Australia, Bangladesh, Brunei Darussalam, Chinese Taipei, Hong Kong SAR, New Caledonia, Philippines, Singapore, Sri Lanka and Thailand.

During the first and second quarters of 2021, reported diseases for finfish include Infection with *Aphanomyces invadans* (Australia and Chinese Taipei), Infection with red seabream iridovirus and Infection with Koi herpesvirus (Chinese Taipei), Viral encephalopathy and retinopathy (Australia, Chinese Taipei, New Caledonia and Singapore), Carp edema virus disease (New Caledonia), and Infection with tilapia lake virus (Philippines). For crustaceans, reported diseases were Infections with viruses including White spot syndrome virus (Philippines, Singapore and Sri Lanka), Infectious hypodermal and haematopoietic necrosis virus (Philippines and Thailand), and Decapod iridescent virus 1 (Chinese Taipei). Also reported were bacterial disease Acute hepatopancreatic necrosis

disease (Philippines, and Thailand), and parasitic disease Hepatopancreatic microsporidiosis caused by *Enterocytozoon hepatopenaei* (Chinese Taipei, Philippines and Thailand).

For molluscs, Australia reported Infections with *Bonamia exitiosa*, *Perkinsus olseni*, and abalone herpesvirus. Lastly for amphibians, Chinese Taipei reported the presence of Infection with *Ranavirus* species, while New Caledonia reported Infection with *Batrachochytrium dendrobatidis*.

Other reported diseases are:

Bangladesh:

- *Streptococcus iniae* (Tilapia and Koi)
- *Aeromonas* sp. (Koi and Shing catfish)
- *Staphylococcus* sp. (Pabda and Shing catfish)

Singapore:

- Scale drop disease virus (Asian seabass)
- Infection with Lymphocystis virus (Red snapper)
- Infection with Nocardia spp. (Threadfin and Red snapper)
- Infection with *Streptococcus iniae* (Red snapper)
- Infection with *Tenacibaculum* sp. (Pompano)

The low number of countries submitting the report is still a concern and it is advised that National Focal Points for Aquatics should take full responsibility in preparing the reports with proper coordination to their respective OIE Delegate who will officially submit the report to OIE. As highlighted during the AGM 19, member countries contribute to the control of transboundary diseases of aquatic animals by complying with their obligations to the OIE to notify the occurrence of listed diseases and emerging diseases. Sharing of information (including disease occurrences) create awareness so that the industry and regulators can actively take the needed risk management measures including emergency preparedness and response. Disease reporting is also useful for countries are having negotiations with their trading partners/countries (e.g. export of shrimp products): importing countries usually check their disease reporting history with reference to OIE six-monthly report and/or NACA-OIE-FAO QAAD Reports. This transparency of disease information is very important for the country to build trust with their trading partners for export of their aquaculture products.

6.2. Dr. Yuko Hood presented updates on Australia's national list of reportable aquatic animal diseases. Australia has a longstanding national reporting program for aquatic animal diseases of significance to fisheries, aquaculture and the environment. As Australia is a federation of states and territories, each jurisdiction is self-governing and has responsibility for disease control within its own borders. Under the national program, all states and territories have agreed to report the diseases that are listed on Australia's National List of Reportable Diseases of Aquatic Animals (National Disease List).

The National Disease List forms the basis of Australia's international reporting obligation and import/export certification, domestic movement and certification, and management of aquatic

animal health priorities. The National Disease List includes important aquatic animal diseases that are either exotic to Australia or occur in only some areas of the country.

Since its inception in 1998, the National List has been updated regularly using an agreed process. The listing criteria have been reviewed periodically and are used to determine the category into which listed diseases are placed: delisted, retained but renamed, or retained but rescoped. New and emerging diseases have also been added through this process. The National Disease List considers whether the revisions made to the World Organisation for Animal Health (OIE) and the Network of Aquaculture Centres in Asia-Pacific (NACA)'s quarterly aquatic animal disease lists, should be included in its updates.

In 2020, Australia revised its listing criteria after the need was raised by the national aquatic animal health committee. In particular, the availability of a relevant diagnostic method for all causative disease agents for nationally reportable diseases was lacking. The revised listing criteria were agreed nationally by all states and territories.

2020 Listing Criteria

The National List contains some diseases that are exotic to Australia and some that occur in parts of Australia. To be listed, diseases must meet at least one of the following criteria:

a. a disease is listed by the OIE in its Aquatic Animal Health Code (Aquatic Code); or

b. a disease is listed by the NACA reporting program that is clearly described by its aetiology (causative agent) and the relevant diagnostic method is available; or
c. a disease is of national and genuine concern to Australia.

Diseases that are not listed by the OIE and NACA may be added to the National List if they are "of national and genuine concern to Australia" (criterion c). For a disease to be listed because it is deemed to be of national and genuine concern to Australia (criterion c), the following criteria must apply:

a. a disease is exotic to Australia, or if it occurs in parts of Australia, vigilance is necessary to minimise its spread; and
b. a disease would have significant socio-economic impacts if it occurred; and
c. a disease can be clearly described by its aetiology (causative agent) and the relevant diagnostic method is available.

Note: "Disease" under the listing criteria is defined as clinical or non-clinical infection with one or more pathogenic agents (using the same definitions of disease and infection as the OIE Aquatic Animal Health Code). Many of the aquatic animal diseases included on the National List are written in the 'Infection with Pathogen X' format to align with the disease naming convention of the OIE Aquatic Animal Health Code.

October 2021 changes to the national list

In 2020, the listing criteria was revised, and the changes nationally agreed upon. All existing listed diseases and new and emerging diseases were assessed against the new listing criteria. The following changes were made after extensive scientific assessments for a number of diseases. To avoid confusion, all assessments were done using the causative agent name, not the disease name.

‘De-listed’ disease agents

1. *Bonamia* species – **Delist**; the pathogen group was poorly described. Among *Bonamia* species that were not on the National List, *Bonamia roughleyi* was considered but its taxonomical status had not been resolved. *B. roughleyi* did not meet the listing criteria.

2. European catfish virus and European sheatfish virus – **Delist**; there were no susceptible species to these pathogens in Australia, hence no impact. The viruses were included as species of epizootic haematopoietic necrosis virus (EHNV) in the OIE Manual of Diagnostic Tests for Aquatic Animals (OIE Manual) and any suspected cases were investigated as part of a suspected case for EHNV.

3. Channel catfish virus – **Delist**; the virus (a herpesvirus) is host specific and there were no susceptible species in Australia.

4. Iridoviroses (for oysters) – **Delist**; the disease has no clear aetiology as disease agents are described as one of several iridoviruses, and there were no relevant diagnostic methods; therefore the disease did not meet the 2020 listing criteria.

‘Re-scoped and renamed’ disease agents

5. **Singapore grouper iridovirus [ranavirus]** – Singapore grouper iridoviral disease was renamed to infection with Singapore grouper iridovirus [ranavirus]. This helped to clarify and differentiate the diseases of grouper caused by various ranaviruses and the disease caused by a Megalocytivirus. The type species of ranavirus, Singapore grouper iridovirus, is a representative of the causative agent of grouper iridoviral disease and is designated by the International Committee on Taxonomy of Viruses (ICTV).

6. **Infectious spleen and kidney necrosis virus** –The group of viruses were rescoped and renamed to infection with infectious spleen and kidney necrosis virus. Previously listed disease agents, infectious spleen and kidney necrosis virus–like viruses had a particular scope. Rescoping and renaming the disease in this way allowed for all megalocytiviruses (genotype ISKNV) causing disease in marine finfish to be included within the scope. The previous definition did not include the disease agents affecting marine fish species.

‘Newly listed’ disease agents

7. **Scale drop disease virus** – an emerging disease agent of barramundi. The virus was confirmed to be causing significant disease in a range of ages of farmed barramundi in both saltwater and

freshwater stages of aquaculture in Asia[2,3,4,5]. Typical clinical signs were abnormal swimming behaviour, darkened dorsal area, skin haemorrhages and scale loss in extensive areas of the body[1]. SDDV is a novel Megalocytivirus, in the family Iridoviridae. SDDV is genetically and pathologically distinct from other megalocytiviruses of international significance, such as red sea bream iridovirus and ISKNV[2]. SDDV can be confirmed using standard single and semi nested PCR[6], qPCR[2,7] and loop mediated isothermal amplification[8] focusing on major capsid protein (MCP) and ATPase genes.

8. **Turbot reddish body iridovirus** – an emerging disease agent of barramundi. TRBIV was originally thought to only cause reddish body syndrome in cold water flat fish species, such as turbot and flounder in north Asia[9,10]. However, the host range has widened to include the temperate barred knifejaw[11]. A new genotype group, Clade II of TRBIV was found in archived imported tropical ornamental fish[12,13], rock bream[9,14] and is an emerging disease agent of barramundi cultured in

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Southeast Asia [15]. The infected fish presented with gross signs of pale gills with local haemorrhage, petechial haemorrhage in fins and fin bases and pronounced haemorrhage in the muscle and skin[8]. TRBIV can be confirmed using standard PCR[8,9,11,14,16,17], qPCR[18], multiplex PCR[19], combined use of clinical phenotype examination and MCP gene sequencing[20] and loop-mediated isothermal amplification[21]. Turbot fin primary cell lines have shown susceptibility to TRBIV[22].

Conclusion

In 2021, 24 fish diseases, 11 mollusc diseases, 13 crustacean disease and 3 amphibian diseases were listed on the National Disease List. The list is publicly available on the Department of Agriculture, Water and the Environment website.

The National Disease List is nationally agreed. This means that all states and territories have agreed to update their animal health legislation to reflect these changes. All jurisdictions (states and territories) have their own animal health legislation that allows them to obtain information on diseases on the list and any new aquatic animal diseases, including significant die-offs of wild aquatic animals that may be reported.

Regular updates to the National Disease List strengthens Australia's aquatic animal health management. A national approach improves disease surveillance, preparedness activities, and guides further research priorities.

DISCUSSION

- QAAD report is a fantastic source of information which is readily available and does help in creating transparency and building trust among trading partners.

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[21] Zhang, Q., Shi, C., Huang, J., Jia, K., Chen, X. and Liu, H., 2009. Rapid diagnosis of turbot reddish body iridovirus in turbot using the loop-mediated isothermal amplification method. Journal of virological methods, 158(1-2), pp.18-23.
[22] Fan, T.J., Ren, B.X., Geng, X.F., Yu, Q.T. and Wang, L.Y., 2010. Establishment of a turbot fin cell line and its susceptibility to turbot reddish body iridovirus. Cytotechnology, 62(3), pp.217-223.

- Regarding the missing quarterly reports from India, the reports have been submitted regularly by the CA. Upon checking (by OIE-RRAP), the reason why the submitted report is not included in the list is that, the CA have used the old QAAD Form. OIE-RRAP will again contact the CA to use the current QAAD Form and once the report is re-submitted, it will be uploaded to the OIE-RRAP and NACA websites.
- For Malaysia's delayed submission of the reports, the government is undergoing some assessment in improving the current procedures to increase transparency and provide internal clearance for disease reporting. Currently, the national pathogen list and national fish health management strategy is also being reviewed and upgraded, and not discounting the effect of pandemic in all these government activities that surely caused the delay in the submission of the disease reports.
- The effort of Australia in revising their national aquatic animal disease list including emerging diseases is well appreciated, and other countries are encouraged to do the same.
- On the recommendation by Australia to change the names of non-OIE listed disease following the OIE nomenclature "Infection with 'pathogen x'", the difference between "disease" and "infection" should be clarified first according to OIE definitions.
- Generally, the use of country names in diseases are not highly appreciated by some countries. For the case of Singapore grouper iridovirus, the disease was originally discovered and identified in Singapore and eventually the name/nomenclature was endorsed and accepted by ICTV. Thus, there is no problem in using country name in the case of Singapore grouper iridovirus.
- In most disease reporting and disease surveillance, countries are reporting the presence of the pathogen even if without the disease, especially when using molecular diagnostics in screening of samples for export or import. If the pathogen is detected during the screening, the country will report the disease to be present in the country.
- Since the "infection with pathogen x" nomenclature of the disease is already adopted in OIE, specifically among aquatic animal diseases, this question on revising the names of the non-OIE listed diseases was raised by Australia a few years back, but the decision will be solely based on the decision of the AG.
- One concern in changing the name to "infection" is on its effect on trade. For molecular diagnostic techniques, the pathogen's nucleic acid can be detected even from fish which are not infected, and this might affect the commercial trading or movement of live aquatic animals and aquatic animal products.
- What is relevant, however, on how the OIE Code is structured is whether viable pathogen is present and provides an opportunity for transmission to uninfected populations.
- Although it is very critical for members, especially those which exports a lot of aquatic animals and aquatic animal products, the OIE WAHIS reporting system requires members to report disease outbreaks, which also include positive results on PCR or other molecular tests even if the animals are showing no clinical signs.
- There are case definitions in the OIE Aquatic Manual which it is advisable to follow. It's also up to the member country in question to conduct sound and prompt diagnostic investigation

for any pathogen detection. Notification requirements are in Chapter 1.1 of the Aquatic Code.

- Since the naming nomenclature is already adopted by OIE, NACA AG should think carefully, before changing any name of the disease, how it would affect the countries especially in the Asia-Pacific region which is the main aquaculture producer. Thus, before making a decision of changing the names of the non-OIE listed diseases, it should be thought thoroughly as it is easy to change but going back to the original may need some time. And if there is really a need to change, this should be discussed in another meeting (and not in AGM) to consider in detail what will be its effect in the aquaculture industry, and in consideration of the goal of NACA in improving the aquaculture in the region.
- It should be noted, however, that the purpose of disease reporting is to understand the disease status of countries with a view to supporting disease control. The critical point is that, the disease is defined precisely. If it is a syndrome, there should be a clear case definition; if a group of pathogens, there should be explicit understanding of which pathogens are in scope. Overall, "infection with pathogen x" or "disease name" caused by pathogen x doesn't really matter – as long as we understand that it is the presence of pathogen not clinical signs that are important for transmission.
- On the status of Infection with DIV1 in the region, only Chinese Taipei is currently reporting the presence of the disease to OIE officially.
- On other emerging viral diseases including Tilapia parvo virus (TiPV) which was identified in China and Thailand according to published scientific report [23] and *Macrobrachium rosenbergii* golda virus (MrGV) reported from Bangladesh[24], there is still no plan at hand to prepare disease cards or disease advisories. So far, these diseases have not been reported (as emerging disease) in both OIE and NACA reporting system, and countries are encouraged to do so (if any of these diseases occur) so that NACA can undertake the necessary actions (including disease advisory and disease card) to inform other countries which are also producing the affected species (tilapia and freshwater prawn). NACA actions on emerging diseases also depends on the possible economic impact of these emerging diseases.
- Again, it is reminded that submitting reports will do more good than harm for the countries concerned.
- Publication of disease cards is still important to help scientists to not go in the wrong direction and to fully understand the disease, especially for emerging diseases which are not yet listed by OIE.
- In the aquatic animal disease reporting, there is a section on "Other Diseases" which can include reports of emerging diseases by member countries, and therefore share the burden of making a disease case when several countries are reporting a particular emerging disease.

[23]Liu W, Zhang Y, Ma J, Jiang N, Fan Y, Zhou Y, *et al*. (2020) Determination of a novel parvovirus pathogen associated with massive mortality in adult tilapia. PLoS Pathog 16(9):e1008765. https://doi.org/10.1371/journal.ppat.1008765.

[24]Hooper C., Debnath P.P., Biswas S., van Aerle,R., *et al*. (2020). A novel RNA virus, *Macrobrachium rosenbergii* golda virus (MrGV), linked to mass mortalities of the larval giant freshwater prawn in Bangladesh. Viruses 2020, 12, 1120; doi:10.3390/v12101120

- In preparing disease card, there is a need for a driver to make one including regional experts or champions who will provide all the necessary (primary) information to be included in the disease card. The most recent disease card prepared by NACA were for two emerging diseases on shrimps, DIV1 and VCMD.
- Emphasis on disease prevention and control should always be included in any discussion, which should focus on recommendations on how to address current disease problems. This may include establishment of a platform where members can share important information on the use of drugs and chemicals, treatment tools, and other certified products for disease control.
- OIE is currently preparing the annex on the list of approved antimicrobials for use in aquaculture at the farm level.

RECOMMENDATIONS

- AG recommended to retain the current names of the non-OIE listed diseases for the aquatic animal disease reporting in the region. It is further recommended that
- AG recommended that NACA should put more emphasis on aquatic animal health management, for example focusing on small-scale farmers and on capacity building especially disease diagnostics and training of aquatic animal health personnel, which is currently on the decline in the region.
- AG recommended to revisit the list of NACA reference laboratories and properly communicate with them to reactivate their commitments in the network and provide their services and resources in aquatic animal health management in the region.

SESSION 7. OTHER MATTERS AND CLOSING

- Dr. Jie Huang thanked all the participants for their time and contribution, and for the success of the AGM 20.
- Dr. Supranee Chinabut, one of the original AG members, also expressed her appreciation to all the participants, and hope that face-to-face meeting will happen soon and give a chance to everyone to attend the forthcoming 11th Symposium on Diseases in Asian Aquaculture. She also thanked NACA for all the efforts in making aquatic animal health management in the region move forward, and in keeping aquatic animal health activities efficient in improving the aquaculture industry, not only in the region but in the whole world as well.
- Dr. Kua Beng Chu provided updates on the organization of the DAA 11, which might be held as a hybrid event in August 2022. The National Organizing Committee is still in continuous communication with relevant agencies in Malaysia for the final arrangements of the event.
- The next AGM (AGM 21) will be held in November 2022, either face-to-face or virtually depending on the situation of the current pandemic.
- The AGM 20 officially closed at 16:00 PM (BKK time), 5 November 2021.

ANNEX A

20TH MEETING OF ASIA REGIONAL ADVISORY GROUP ON AQUATIC ANIMAL HEALTH (AGM19) (VIRTUAL MEETING) 4-5 NOVEMBER 2021 13:00-15:00/16:00 (BKK TIME; GMT+7)

AGENDA:

Day 1 (4 November)

Welcome and Introduction (15 mins)

- Introduction (Dr. Eduardo Leaño)
- Welcome Remarks (Dr. Jie Huang, DG NACA)
- Self-introduction (all participants)

Vice-Chairperson (Dr. Jing Wang) will take over in moderating the meeting

Progress since AGM 19 (15 mins; Dr. Eduardo Leaño, NACA)
Updates from OIE Aquatic Animal Health Standards Commission (15 mins; Dr. Ingo Ernst, AAHSC, OIE)
Aquaculture Biosecurity (PMP/AB) (15 mins; Dr. Bin Hao, FAO)
A systematic approach for quantifying biosecurity measures in aquaculture (15 mins; Dr. Saraya Tavornpanich, NVI)

Note: 15-20 minutes discussion and recommendations after each presentation (Country representatives are encouraged to participate actively in the discussion)

Day 2 (5 November)

Welcome and recap of day 1 (5 mins; NACA Secretariat)
The OIE Aquatic Animal Health Strategy 2021-2025: Overview and its relevance to the AP region (15 mins; Dr. Stian Johnsen, OIE)
Updates on OIE Regional Collaboration Framework on AAH (15 mins; Dr. Jing Wang, OIE-RRAP)
Updates on QAAD Reporting and disease list (10 mins; Dr. Eduardo Leaño, NACA)
Other issues including emerging diseases in the region (if any) (10 mins)

Note: 15-20 minutes discussion and recommendations after each presentation (Country representatives are encouraged to participate actively in the discussion; some country representative will also be called to present current activities on AAH in their respective country)

ANNEX B

List of Participants (AGM 20)

I. Advisory Group Members
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Annex C:
List of Diseases in the Asia-Pacific

Reportable Aquatic Animal Diseases
(Beginning January 2022)

1. DISEASES PREVALENT IN THE REGION	
1.1 FINFISH DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with epizootic haematopoietic necrosis virus	1.Grouper iridoviral disease
2. Infection with infectious haematopoietic necrosis virus	2.Viral encephalopathy and retinopathy
3. Infection with spring viraemia of carp virus	3.Enteric septicaemia of catfish
4. Infection with viral haemorrhagic septicaemia virus	4.Carp edema virus disease (CEVD)
5. Infection with *Aphanomyces invadans* (EUS))	5. Tilapia lake virus (TiLV) disease
6. Infection with red seabream iridovirus	
7. Infection with koi herpesvirus	
1.2 MOLLUSC DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with *Bonamia exitiosa*	1. Infection with *Marteilioides chungmuensis*
2. Infection with *Perkinsus olseni*	2. Acute viral necrosis (in scallops)
3. Infection with abalone herpes-like virus	
4. Infection with *Xenohaliotis californiensis*	
5. Infection with *Bonamia ostreae*	
1.3 CRUSTACEAN DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with Taura syndrome virus (TSV)	1. Hepatopancreatic microsporidiosis (HPM) caused by *Enterocytozoon hepatopenaei* (EHP)
2. Infection with White spot syndrome virus (WSSV)	
3. Infection with yellow head virus genotype 1	2. Viral covert mortality diseases (VCMD)
4. Infection with Infectious hypodermal and haematopoietic necrosis virus (IHHNV)	3. *Spiroplasma eriocheiris* infection
5. Infection with Infectious myonecrosis virus (IMNV)	
6. Infection with *Macrobrachium rosenbergii* nodavirus (MrNV; White tail disease)	
7. Infection with *Hepatobacter penaei* (Necrotising hepatopancreatitis)	
8. Acute hepatopancreatic necrosis disease (AHPND)	
9. Infection with *Aphanomyces astaci* (Crayfsh plague)	
10. Infection with Decapod iridescent virus 1 (DIV1)	
1.4 AMPHIBIAN DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with *Ranavirus* species	
2. Infection with *Bachtracochytrium dendrobatidis*	
3. Infection with *Batrachochytrium salamandrivorans*	
2. DISEASES PRESUMED EXOTIC TO THE REGION	
2.1 Finfish	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with HPR-deleted or HPR0 salmon anaemia virus	1. Channel catfish virus disease
2. Infection with salmon pancreas disease virus	
2. Infection with *Gyrodactylus salaris*	
2.2 Molluscs	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with *Marteilia refringens*	
2. Infection with *Perkinsus marinus*	

Annex D:

ASIA REGIONAL TECHNICAL GUIDELINES – STATUS OVERVIEW (ADOPTED FROM AGM 9 REPORT)

Element of technical guidelines	Progress / status	Gaps / opportunities
1. Disease reporting *An understanding of the basic aquatic animal health situation is a pre-requisite for prioritising activities, developing national policy and identifying pathogens of national importance.*	• Regional QAAD reporting system established – participation has increased • The QAAD list has incorporated emerging diseases that were later listed by the OIE • Many countries have established national lists for reporting purposes with appropriate supporting legislation	• Participation could improve further – some countries report irregularly • The proposed regional core utilising the OIE's WAHID will streamline reporting and may improve participation • The exact status of individual countries with regard to adoption of national lists and supporting legislation is not know
2. Disease diagnosis *Diagnosis requires various levels of data, starting with farm- or site-level observations and progressing in technical complexity to electron microscopy, immunological and nucleic acid assays and other biomolecular methods. This means all levels of expertise, including that of the farmer and extension officer working at the pond side, make essential contributions to rapid and accurate disease diagnosis.* *Effective diagnostic capability underpins a range of programs including early detection for emergency response and substantiating disease status through surveillance and reporting.*	• Diagnostic capabilities have improved in many countries • NACA disease cards have been developed and maintained for emerging diseases • The Asia regional diagnostic manual has been developed • An Asia regional diagnostic field guide has been developed • OIE reference laboratories • Regional reference laboratories – where no OIE reference laboratory exists • Regional Resource Experts are available to provide specialist advice • Ad hoc laboratory proficiency testing programs have been run	• OIE twinning programs are a means to assist laboratories to develop capabilities • The exact status of diagnostic capability in individual countries is not certain • There is limited or no access to ongoing laboratory proficiency testing programs • Some areas of specialist diagnostic expertise are lacking • Network approaches are a means draw on available diagnostic expertise
3. Health certification and Quarantine measures *The purpose of applying quarantine measures and health certification is to facilitate transboundary trade in aquatic*	• Strong progress has been made, particularly for high risk importations (e.g. importation of broodstock and seed stock) • Training has been provided through regional initiatives (e.g. AADCP project)	• The importance of supporting aquatic animal health attestations through sound aquatic animal health programs continues to be underestimated, with possible ramifications for trade

animals and their products, while minimising the risk of spreading infectious diseases	• Commercial implications for trade have driven improved certification practices • Harmonisation with OIE model certificates has occurred	• Some inappropriate or illegal activities continue and threaten to spread trans-boundary diseases
4. Disease zoning and compartmentalisation *Zoning (and compartmentalization) allows for part of a nation's territory to be identified as free of a particular disease, rather than having to demonstrate that the entire country is free. This is particularly helpful to facilitate trade in circumstances where eradication of a disease is not feasible.Zoning is also an effective tool to restrict the spread of important pathogens and aid in their eradication.*	• Is an emerging need to meet requirements of importing countries • To facilitate trade, some countries are working toward having compartments and zones recognised	• Where common health status can be identified restrictions on trade can be reduced • Training opportunities would be beneficial • Learn from the experience of terrestrial animal industries (e.g. poultry)
5. Disease surveillance and reporting *Necessary to produce meaningful reports on a country's disease status by providing evidence to substantiate claims of absence of a particular disease and thereby support import risk analysis, justify import health certification requirements, and enable export health certification*	• Regional Resource Experts are available to provide specialist advice • Training has been provided through a number of initiatives (e.g. AADCP project) • Many published resources are available, including those of the OIE (publications and the OIE centre for aquatic animal epidemiology) • Collation of surveillance information has improved through participation in international reporting	• Remains a reliance on passive surveillance. Active surveillance may be beneficial but cost is often a barrier. • Methodologies to undertake effective but low-cost active surveillance would be of assistance • Epidemiological expertise is often limited • There is a need to increase surveillance of wildlife to support health status
6. Contingency planning *Important to provide a rapid and planned response for containment of a disease outbreak—thereby limiting the impact, scale and costs of the outbreak*	• Important provides a rapid and planned response for containment of a disease outbreak Some countries have advanced contingency planning with appropriate supporting legislation • Some countries have tested contingency plans through simulation exercises • Resources are available (e.g. Australia's AQUAVETPLAN, FAO guidelines, OIE links to resources)	• The exact status of contingency planning in individual countries is not certain • Training in emergency management frameworks may be useful • Support for developing contingency plans might usefully be directed at particular disease threats e.g. IMN

7. Import risk analysis *The movement of live aquatic animals involves a degree of disease risk to the importing country. Import risk analysis (IRA) is the process by which hazards associated with the movement of a particular commodity are identified and mitigative options are assessed. The results of these analyses are communicated to the authorities responsible for approving or rejecting the import.*	• Numerous resources and case studies published • The approach has been applied, particularly for some circumstances e.g. import of live *P. vannamei* • However risk analysis is not always applied, or is not applied appropriately • Regional training has been provided (e.g. AADCP project)	• There is a need to build awareness of the concepts • Training can be abstract and disengaging - should aim at trainees learning on scenarios relevant to their circumstances • This is a high priority generic need that is suited to development of a central training program
8. National strategies *The implementation of these Technical Guidelines in an effective manner requires an appropriate national administrative and legal framework, as well as sufficient expertise, manpower and infrastructure.*	• Many countries have developed national strategies • Detailed assistance has been provided to some countries (e.g. AADCP project)	• The exact status of national strategies in individual countries is not certain • The OIE's PVS tool provides a means of assessing the progress of individual countries