NETWORK OF AQUACULTURE CENTRES IN ASIA-PACIFIC

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

REPORT OF THE MEETING

Hotel Motimahal, Mangalore, India

19-20 November 2011

Prepared by the NACA Secretariat

Preparation of this document:

This report was prepared by the 10th Asia Regional Advisory Group (AG) on Aquatic Animal Health (AGM-10) that met at Hotel Motimahal, Mangalore, India on the 19th to 20th November 2011.

The Advisory Group was established by the Governing Council of the Network of Aquaculture Centres in Asia-Pacific (NACA) 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, World Animal Health Organization (OIE), Food and Agricultural Organization of the United Nations (FAO) and collaborating regional organizations.

Reference: NACA 2011. Report of the Tenth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health. Published by the Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand.

ABBREVIATIONS AND ACRONYMS

AADCP-RPS	ASEAN Australia Development Cooperation Program – Regional Partnership Scheme
AAHRI	Aquatic Animal Health Research Institute (Thailand)
AAHSC	Aquatic Animal Health Standards Commission of the OIE
AAPQIS	Aquatic Animal Pathogen and Quarantine Information System (FAO)
AbHV	Abalone Herpesvirus
ADG	Asia Diagnostic Guide
AG	Advisory Group
AGM	Advisory Group Meeting
AHDNS	Acute Hepatopancreatic Degenerative Necrosis Syndrome
ANAAHC	ASEAN Network of Aquatic Animal Health Centres
ANQAP	Australian National Quality Assurance Program
APEC	Asia-Pacific Economic Cooperation
APIQTC	Animal and Plant Inspection and Quarantine Technology Center (China)
ASDD	Abdominal segment deformity disease (in *P.vannamei*)
ASDV	Abdominal segment deformity virus
ASEM	Asian European Meeting
ASEAN	Association of South East Asian Nations
AVG	Abalone viral ganglioneuritis
AVM	Abalone viral mortality
BIOTEC	National Center for Genetic Engineering and Biotechnology (Thailand)
COFI	Committee on Fisheries (FAO)
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DoF	Department of Fisheries (Thailand)
EU	European Union
EUS	Epizootic ulcerative syndrome
FAO	Food and Agricultural Organization of the United Nations
GC	Governing Council of NACA
IHHNV	Infectious hypodermal and haematopoietic necrosis virus
IMN	Infectious myonecrosis
IMNV	Infectious myonecrosis virus
KHV	Koi herpesvirus
KHVD	Koi herpesvirus disease
LSNV	Laem Singh necrosis virus (in *P. monodon*)
*Mr*NV	*Macrobrachium rosenbergii* nodavirus
MSGS	Monodon slow growth syndrome
NACA	Network of Aquaculture Centres in Asia-Pacific
NaCSA	National Center for Sustainable Aquaculture (India)
NC	National Coordinator
NHP	Necrotising hepatopancreatitis
OIE	World Organisation for Animal Health
PCR	Polymerase chain reaction
PICT	Pacific Island Countries and Territories
*Pv*NV	*Penaeus vannamei* nodavirus
QAAD	Quarterly Aquatic Animal Disease
RRC	Regional resource centre
RRE	Regional resource expert
RRL	Regional reference laboratory
RT-PCR	Reverse transcriptase PCR
SAARC	South Asian Association for Regional Cooperation
SEAFDEC	Southeast Asian Fisheries Development Center
SEAFDEC-AQD	Southeast Asian Fisheries Development Center Aquaculture Department
SPC	Secretariat of the Pacific Community
SPF	Specific pathogen free
SVC	Spring viraemia of carp
SVCV	Spring viraemia of carp virus
TAC	Technical Advisory Committee of NACA

TG	Technical Guidelines (Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals)
TOR	Terms of Reference
TS	Taura syndrome
TSV	Taura syndrome virus
VHS	Viral Haemorrhagic Saepticemia
WAHIS	World Animal Health Information System
WAHID	World Animal Health Information Database
WFC	WorldFish Center
WSD	White spot disease
WSSV	White spot syndrome virus
WTD	White tail disease
WTO	World Trade Organization
YHV	Yellowhead virus

The 10th Asia Regional Advisory Group on Aquatic Animal Health.

(From Left to Right)

Front Row: Dr. Hnin Thidar Myint (OIE-Tokyo); Dr. Edgar Amar (SEAFDEC AQD, Philippines); Dr. Rohana Subasinghe (FAO, Rome); Dr. C.V. Mohan (NACA).

Back Row: Prof. Timothy Flegel (Centex, Thailand); Dr. Ingo Ernst (DAFF, Australia); Prof. Barry Hill (OIE-France); Dr. Brett Herbert (DAFF, Australia); Dr. John Bostock (guest participant; EU-ASEM); Dr. Siow Foong Chang (MSD Animal Health, Singapore); Dr. Eduardo Leaño (NACA).

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OPENING SESSION

A brief introduction was given by Dr. Eduardo Leaño, Coordinator of Aquatic Animal Health Programme of NACA, who served as the Technical Secretary for the Advisory Group (AG). Dr. Kalkuli Shankar, Dean of the College of Fisheries, Karnataka Veterinary, Animal and Fisheries Sciences University, and Chairperson of the Local Organizing Committee of 8th Symposium on Diseases in Asian Aquaculture (DAA8) welcomed all the participants to Mangalore.

Dr. Ambekar Eknath, Director General of NACA, made a brief introduction of NACA's current programmes in his Opening Remarks, including Aquatic Animal Health, Fish Genetics, Sustainable Farming Systems, Food Safety, Quality and Certification, and Impact of and Response to Climate Change. Aquatic Animal Health is the longest running programme of NACA, and although significant achievements have been reached in the region, contingency planning and risk analysis are still needed and should be implemented. Dr. Eknath congratulated AG's achievements in its 10th year of existence, especially in dealing with aquatic animal health strategies, transboundary issues, and disease surveillance among others. AG has become a guiding force in aquatic animal health management in the region, in cooperation with other international organizations such as OIE, FAO and DAFF-Australia, and NACA is looking forward to strengthen further the partnership with these organizations in the future.

Dr. Ingo Ernst, Chairperson of 9th and 10th AG, presided over the 10th AGM and the meeting agenda was adopted (Annex A). List of participants is presented in Annex B.

SESSION 1: PROGRESS SINCE AGM-9

1.1 PROGRESS REPORT FROM NACA'S REGIONAL AQUATIC ANIMAL HEALTH PROGRAMME

Dr. Leaño presented the progress report of NACA's Regional Aquatic Animal Health Programme in reference to the Action List made during the 9th AGM. In December 2010, NACA was invited as keynote lecturer during the Tahiti Aquaculture 2010 where Mr. Simon Wilkinson presented a papers on "Promoting Biosecurity and Aquatic Animal Health Management in the Asia-Pacific Region: the Role of NACA" and "Linking Small-scale Farmers to Markets: Lessons Learned in Asia-Pacific" During the conference, NACA's Regional Aquatic Animal Health Programme was frequently referred to as a "model" programme which can be implemented to other regions around the world. One of the main issues tackled during the 9th AGM was the importance and current threat of Infectious Myonecrosis (IMN) in the region. The recommended actions for this issue were accomplished: initial meeting of IAAHRI, FAO and NACA to discuss plans for disease awareness and preparedness in the region was undertaken in November 2010; NACA published and disseminated a 1-page flyer about the disease in December 2010; and, AAHRI, DOF-Thailand and FAO-RAP undertook IMN Training Workshop in Indonesia in October 2011.

Other activities presented are as follows:

- OIE National Focal Point Meeting (Ho Chi Minh City, Vietnam; 19-22 April 2011). One of the actions recommended during the AGM 9 is convening of a regional meeting for National Coordinators/Aquatic Focal Points, and OIE Sub-regional Representation for Asia-Pacific has organized a 3-day meeting in this regard. NACA actively participated in the planning/formulation of the programme and E. Leaño gave two lectures: 1) Aquaculture and Aquatic Animal Health in the Asia Pacific Region: History, Trends, Existing Organizations and Networks; and 2) Issues in the Implementation of OIE Standards in the Countries of the Region: NACA Experience.
- Four QAAD reports were published (2010/3; 2010/4; 2011/1; and 2011/2) with an average of 15 reports submitted for each quarter. Necrotising hepatopancreatitis was added in the OIE-listed diseases, and the revised list was used for reporting from the first quarter of 2011.
- Five experts from China were added to the list of RRE's, while the Shenzhen Entry-Exit Inspection and Quarantine Bureau was updated to Animal and Plant Inspection and Quarantine Technology Centre (APIQTC) as RRL of NACA.

- Pilot-testing for the OIE-NACA WAHIS regional core was initiated in September 2011 with five participating countries: Malaysia; Philippines; Sri Lanka; Thailand; and Vietnam. There was no update on the result of pilot-testing.
- Dr. Mohan participated as a resource person at the OIE Global Conference on Aquatic Animal Health Programme held in Panama, June 2011. He presented a talk on "Aquatic Animal Health Issues: Asia-Pacific". The conference was attended by aquatic animal health delegates from over 150 countries.
- News about the new shrimp disease outbreak in Vietnam prompted NACA to get in contact with the NC, Dr. Le Van Khoa, for some updates and information. Upon the request of NC, NACA properly coordinated with FAO and other shrimp disease experts in the region to deal with the problem. FAO and OIE sent an emergency mission to Vietnam in this regard.
- The Australia-DAFF sent Dr. Brett Herbert for short-term placement to NACA to develop a Regional Emergency Preparedness Plan project on aquatic animal health. The proposal will be submitted to funding agencies for consideration, upon the approval of the AG.
- BOBLME-NACA Expert Group Workshop on Transboundary Aquatic Animal Health Issues in the Bay of Bengal was supposed to be held on 3-4 November 2011. However, this was postponed to January 2012 due to the flood crisis that hit Bangkok in late October.
- A short article on "Animal Welfare (for Farmed Fish)…Is Asia-Pacific Ready?" was published in Aquaculture Asia by E. Leaño and C.V. Mohan. This article summarized the status of fish welfare in the region which is somehow non-existent.

DISCUSSION

- AG acknowledged the progress made on IMNV awareness in the region, having completed all the recommended actions during the AGM9.
- On the recent shrimp disease outbreak in Vietnam, it was noted that NCs are not taking the initiative to report the problem to NACA. There is also lack of coordination among the national government, universities and other institutes on how to deal with the problem. It was suggested that countries should have emergency response strategies that are in place for any disease emergencies that might occur in the future.

RECOMMENDATIONS

- IMN remains a risk in the region and further works are needed to mitigate or manage the risk. AG supported the development of a larger TCP project on capacity building in the region in this regard. This should include:
    - Effective emergency response and procedures;
    - Simulation exercises in one or two countries. As this exercise will require so much resource that may not be feasible in most member countries, other countries should be invited as observers once simulation exercise is implemented in one country. This is for proper dissemination of necessary actions and information on IMN and its spread.
    - Early warning mechanisms
- On animal welfare issue and considering the many market outlets in the region, AG recommended to focus on the benefits that can be derived from implementing animal welfare regulations, which is not just market-based but also quality-based.
- On disease awareness, AG recommended that member countries should cooperate in dealing with aquatic animal health management, especially on preventing transboundary spread of pathogens/diseases (e.g. IMNV).

SESSION 2: OIE STANDARDS AND GLOBAL ISSUES

2.1. OUTCOMES OF RECOMMENDATIONS FROM OIE GENERAL SESSION AND THE AQUATIC ANIMAL HEALTH STANDARDS COMMISSION

Dr. Barry Hill presented the OIE report.

Country comments on the draft texts circulated in October 2010 were incorporated in the amended draft during the AAC February 2011 meeting, and recirculated again for further comments prior to the GS meeting in May 2011. On listing of aquatic animal diseases, a number of amendments were made for harmonization of *Aquatic Code* and *Terrestrial Code*. On OIE-listed diseases, the causative agent of NHP will be likely to be named in the near future and the disease name "Infection with (name of pathogen; once confirmed) will be followed. In relation to this, the disease Gyrodactylosis was also renamed to "Infection with *Gyrodactylus salaris*". The AAC also invited Chile to submit additional supporting evidence for Pancreas Disease (PD) in accordance with Criteria 6 and 7 of Listing Diseases in OIE. Other proposed amendments in the Aquatic Code are as follows:

- Protocols on disinfection of non-salmonid eggs;
- Proposed amendments in the corresponding chapter in the Terrestrial Code on the quality of Aquatic Animal Health Services were considered as part of the harmonization process of both Codes;
- Introduction of Chapter 6.1 (Control Hazards in Aquatic Animal Feeds) was amended to clarify that the chapter covers both aquatic animal and public health;
- Pharmacological methods of stunning fish was decided not to be included in Chapter 7.3 (Welfare Aspects of Stunning and Killing of Farmed Fish for Human Consumption) due to lack of information on food safety aspect of these methods;
- On the Principles for Responsible and Prudent Use of Antimicrobial Agents in Aquatic Animals (new Chapter 6.3), a provision for an aquatic animal health professionals being authorized to prescribe or recommend the use of antimicrobials is needed to be made. A chapter dealing with the problem on shortage of authorized antimicrobial agents for use in aquaculture is also proposed by the AAC.
- An issue was also raised that OIE Reference Laboratories should have certified Veterinarians.
- The following are the newly designated Reference Laboratories:
    - OIE Reference Laboratories for WSD and IHHN
    - Disease Control and Molecular Pathology Laboratory, Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences
    - CHINA (PEOPLE'S REP. OF)
    - Designated Reference Expert: Dr Jie Huang
- OIE Reference Laboratory of SVC
    - The Laboratory of Aquatic Animal Diseases, Shenzhen Exit & Entry Inspection and Quarantine Bureau, AQSIQ
    - CHINA (PEOPLE'S REP. OF)
    - Designated Reference Expert: Dr Hong Liu
- OIE Reference Laboratory for Infection with AHV
    - Australian Animal Health Laboratory (AAHL), CSIRO Livestock Industries AUSTRALIA
    - Designated Reference Expert: Dr Mark Crane
- There are also changes of some experts at OIE Reference Laboratories as follows:
    - Infection with *M. mackini*
        - Dr Gary Meyer to replace Dr Susan Bower
        - The Pacific Biological Station, Fisheries and Oceans Canada, Nanaimo, British Columbia, CANADA
    - Infection with P. marinus, P. olseni; Infection with H. costale, H. nelsoni
        - Dr Ryan Carnegie to replace Dr Eugene Burreson

        - The Virginia Institute of Marine Science, College of William and Mary Gloucester Point, USA
    - A new chapter (Chapter 7.4: Killing of Farmed Fish for Disease Control Purposes) and amendments on the Glossary of the Aquatic Code were circulated to member countries for comments.

DISCUSSION

- One issue that raise concerns is on the statement that OIE Reference Laboratories should have certified veterinarians. This will not be applicable for aquatic animal health services and once implemented, many aquatic animal disease reference laboratories will be excluded due to the absence of certified vets (e.g. EUS in Thailand; WTD in India; many Reference Laboratories in Japan).

RECOMMENDATIONS

- The AG considered that many of the recent developments in OIE Code and manual are very relevant and important to the region and NACA make efforts to widely disseminate this information to the CAs in its member countries.
- AG recommended that NACA explore opportunities to make written comments to relevant issues raised by OIE (e.g. animal welfare, use of antimicrobials in aquaculture, etc.) upon the approval of NACA member countries. There is a need to discuss with OIE and member countries/governments in formulating the formal agreement in this regard.
- On the issue of Reference Laboratories for aquatic animal diseases without certified veterinarians, AG recommended that NACA assist the concerned laboratories to formulate relevant comments regarding the issue, for submission to OIE before the GS is held in May 2012.
- The AG suggested that the OIE consideration of making a provision for an aquatic animal health professionals being authorized to prescribe or recommend the use of antimicrobials be widely disseminated to member countries.

2.2. UPDATES ON AQUATIC ANIMAL HEALTH ACTIVITIES OF FAO

Dr. Rohana Subasinghe made a short report on the current aquatic animal health activities of FAO. The report focused on the recent WSD outbreak in Mozambique where OIE and FAO sent a join mission. This is the first report of WSD outbreak in Africa, which is just two years after EUS was first reported in the region in 2009 (EUS is now affecting 3 countries in Africa). On recent WSD outbreak, stocks of one 40-hectare farm were completely wiped out including the hatchery, broodstock, and grow-out, causing a total loss of US$35 million. It is, however, important to note that all the broodstock came from the wild, thus it is a big question on how WSD came into the region and affected the prawn farm in Mossambique. A greater concern is for the neighboring country Madagascar where prawn farming is also on-going.

Another important aquatic animal disease emergency mission is the recent *P. vannamei / P. monodon* problem in Vietnam. The outcome of the emergency mission cannot be published/disseminated yet as it is still not approved by the Vietnamese government. No further development is available after what has been done during the mission. Follow-up project should be functional by middle of 2012 to include: etiology and epidemiology of the disease. A US$40 million Aquaculture Project will include aquatic animal health, and capacity building for shrimps and *Pangasius* catfish.

On general aquatic animal health outbreaks/problems which is causing the industry an annual loss of around US$60 billion, biosecurity is a paramount requirement for future food (including food safety, transboundary issues). The whole concept of aquatic animal health management needs serious thoughts on how to reduce this annual loss in aquaculture.

RECOMMENDATIONS

- Given the recent outbreaks of two major aquatic animal diseases in Africa: EUS in 2009 and WSD in 2011, AG agreed that there is a common interest for strengthened inter-regional cooperation to assist the African region using the Asian experience in dealing with these diseases.

- AG also recognized the productive cooperation between NACA and FAO to address the current shrimp disease problem in Vietnam and Indonesia (e.g. IMNV and AHDNS).
- AG agreed that biosecurity is a paramount requirement for future food, thus emphasis should be given on issues like food safety, transboundary movement and transfer of aquatic animals, and better aquatic animal health management.

SESSION 3: REVIEW OF REGIONAL DISEASE STATUS

3.1. UPDATES ON CRUSTACEAN DISEASES IN THE REGION

White spot syndrome virus continues to be the most significant shrimp pathogen in all the major culture nations in Asia. Other pathogens are of importance to individual nations according to circumstance or species cultured. For example, infectious myonecrosis (IMN) is still problematic only for Indonesia. The most threatening new problem in Asian shrimp aquaculture at this time is serious mortality from unknown causes that began in China in 2009, then Vietnam since 2010 and more recently in 2011 to the eastern side of southern Malaysia and the eastern side of the gulf of Thailand. This unknown syndrome is known by different names (e.g. early mortality syndrome, Acute hepatopancreatic degenerative necrotic syndrome). In 2006, IMN caused by a virus (IMNV) was first described from Indonesia (Senapin et al. 2007; Aquaculture 266:32-38) as a probable example for disease translocation with aquaculture stocks from Brazil. Since then, rumours have circulated in other Asian countries regarding IMN disease outbreaks, but continual testing at Centex Shrimp have revealed that these have been false (Senapin et al. 2011; BMC J Negative Results in Biomedicine. 10:10). Most of these rumours were probably caused by muscle cramp syndrome that can commonly cause whitened muscles in stressed *Penaeus (Litopenaeus) vannamei*. Additional rumours may have resulted from light, false-positive RT-PCR results using the IQ2000 test kit with DNA extracts from shrimp pleopods rather than excised, infected muscle tissue or hemolymph (i.e., internal material). Since samples from the outbreaks in Vietnam and China have tested negative for IMNV by RT-PCR, histopathology and immunohistochemistry and since shrimp from IMN outbreak ponds would give RT-PCR results indicating moderate to severe IMNV infections and not very light infections, IMNV can be ruled out as the cause of the problems in Vietnam and China. In addition, other pathogens newly discovered in *P. vannamei* from Thailand and Vietnam [including *Macrobrachium rosenbergii* nodavirus (MrNV) and the microsporidian *Enterocytozoon hepatopenaei*] have also proven not to be the cause of the massive disease outbreaks based on low prevalence in tested specimens from the outbreak ponds as revealed by histological analysis, PCR testing and immunohistochemistry. In addition, tests for necrotizing hepatopancreatic necrosis (NHP) have proven negative by PCR testing, histological analysis and transmission electron microscopy (TEM). TEM has also failed to reveal the presence of any potential viral pathogen. A case definition for the syndrome affecting shrimp in the outbreak ponds has been described by D.V. Lightner from the University of Arizona (unpublished) and this is consistent with the specimens that have been received and analysed by Centex Shrimp in Thailand (T.W. Flegel, unpublished). Dr. Lightner has referred to this syndrome as an idiopathic condition called acute hepatopancreatic degenerative necrosis syndrome (AHDNS) that can be described as acute progressive degeneration of the hepatopancreas (HP) with the following histological features:

1 Lack of mitotic activity in generative E cells of the HP
2 Medial to central dysfunction of hepatopancreatic B, F and R cells
3 Prominent karyomegaly and massive sloughing of medial to central HP tubule epithelial cells
4 Terminal stages including massive intertubular hemocytic aggregation followed by secondary bacterial infections

These characteristics should be widely circulated and used to examine shrimp samples in order to determine whether new shrimp disease outbreaks fit the case definition for AHDNS in the absence any test for a known etiological agent. So far no potential causative pathogen has been found and possible etiologies include toxins (biotic or abiotic), bacteria and viruses. All of these possibilities are being examined. In addition, epidemiological work is being done.

DISCUSSION

- The inclusion of the new disease, Acute Hepatopancreatic Degenerative Necrosis Syndrome (AHDNS), in QAAD list of diseases was discussed. However, it still doesn't meet the criteria for listing, thus it will be reported as "Other Diseases".

RECOMMENDATIONS

- Recognizing the importance/threat of AHDNS to the shrimp industry in the region, AG recommended to make a request to Dr. Donald V. Lightner to prepare the case definition of the disease. NACA will then prepare the corresponding Disease Card and for circulation to NACA member countries and uploading at NACA website.
- AG also recommended NACA to encourage member governments to report any occurrence/outbreak of AHDNS through immediate reporting and/or the QAAD Reporting System.
- Considering the threat posed by IMNV, AG suggested that all member countries should enhance their surveillance and quarantine efforts to minimize the risk of introducing this pathogen through movement of brood stock and seed. This caution should also be applied to all SPF/SPR broodstock and seeds.
- AG also recommended that member governments should be encouraged to report the occurrence (suspected and confirmed) of IMNV in their respective countries through QAAD reporting system.
- Considering the threat posed by emerging diseases (e.g. AHDNS) the AG recommended that governments should be encouraged to develop and implement sound disease preparedness plans.

3.2. UPDATES ON FINFISH DISEASES IN THE REGION

Dr. Siow Foong Chang presented an overview of finfish disease in the region with emphasis on two significant issues.

The first issue was on the need to further clarify on the reporting for iridoviruses. There are currently several distinguishable iridoviruses in Asia: infectious skin and kidney necrosis virus (ISKNV) and red sea bream iridovirus (RSIV) from the megalocytivirus genus; and iridoviruses belonging to the ranavirus genus. The current system of reporting "grouper iridoviral disease" in QAAD does not adequately distinguish the viruses. To benefit future epidemiological studies and implementation of control measures, it will be useful to review the classification for the reporting of iridoviruses to distinguish between iridoviruses. The chapters for RSIV in the OIE manual and health code should also be reviewed and aligned to clarify the status of ISKNV.

The second issue is the occurrence of a disease (Scale-drop syndrome) in Asian seabass. This disease has been previously described many years go, but is often masked by concurrent parasite and marine flexibacter (*Tenacibaculum maritimum*) infection. The disease causes chronic mortalities in affected seabass farms. There is currently no direct diagnostic test available, and presumptive diagnosis is by observation of systemic vasculitis via histopathology. Although only present in a few seabass farms, this disease should be monitored for potential spread and impact on seabass production.

DISCUSSION

A need to differentiate ISKNV with RSIV and Ranaviruses was discussed, as there are different types of iridoviruses present in the region, with different distribution range and epidemiology.

RECOMMENDATIONS

- On Scale-drop Syndrome of Asian seabass, AG recommended to make a follow-up discussion with Dr. Susan Kueh-Gibson (Murdoch University) for more detailed findings about the disease, to include histopathology and diagnostics.
- The AG recommended that a disease card be developed and widely circulated so as to encourage surveillance and reporting of this syndrome under other diseases in the regional QAAD.
- AG also suggested to provide clarity as to what type of iridovirus is present in the region, and to find the definition for different iridoviruses including RSIV, ISKNV and Ranaviruses. These should be looked at after the revised OIE manual is published in 2012.

(***NOTE**: No updates on Diseases of Mollusks and Amphibians*).

SESSION 4: REPORTS ON AQUATIC ANIMAL HEALTH PROGRAMMES FROM PARTNER AGENCIES

4.1. AUSTRALIA'S NATIONAL AQUATIC ANIMAL HEALTH PROGRAMMES

Dr Ingo Ernst presented a report on aquatic animal health programs in Australia and some regional activities.

Changes to Australia's National List of Reportable Diseases of Aquatic Animals were made recently. The changes include the addition of necrotising hepatopancreatitis, ostreid herpes virus – 1 microvariant, and ISKNV-like viruses.

The First Australasian Scientific Conference on Aquatic Animal Health was held in Cairns in July 2011. This conference has evolved from a biennial national conference on aquatic animal health. There were more than 120 participants and 72 presentations, including those from the keynote presenter (Dr. Teruo Miyazaki – Mie University, Japan) and invited speakers (Dr Niels Jørgen Olesen (EU Reference Laboratory for Fish Diseases, Denmark), Dr Isabelle Arzul (EU Reference Laboratory for Mollusc Diseases, France) and Dr Ed Peeler (epidemiologist at CEFAS Weymouth Laboratory UK). The conference included sessions on vertebrate viruses, bacterial and fungal infections of finfish, emergency disease response, finfish parasites, finfish pathology, finfish immunology and vaccines, crustacean health, mollusc health and diagnostics.

High mortalities of Pacific oysters in a single estuary in NSW were reported in late November 2010. Controls on movement of oysters and equipment were put in place and the mortalities were investigated. The mortalities were described as Pacific oyster mortality syndrome (POMS). Ostreid herpes virus-1 micro variant (OsHV-1 µvar) was confirmed on 6 January 2011 and an immediate notification made to the OIE on 7 January 2011. OsHV-1 was later detected in wild Pacific oysters in a second adjacent estuary (no oyster farming occurs in this estuary). A national survey found no evidence of OsHV-1 from any Pacific oyster growing regions in Australia outside of the two where OsHV-1 had been confirmed — over 4300 oysters were sampled from 23 growing regions. The survey was designed in accordance with international standards to provide defensible evidence of freedom from OsHV-1. The response objective is to contain the virus to the two affected estuaries. A range of activities have been undertaken to support preparedness and response, including: epidemiological research, an international workshop on OsHV-1 (Cairns, July 2011), an industry study tour to France, development of a research and development plan, and an industry emergency response planning project.

Dr Ernst provided a report on two regional activities. The Tahiti Aquaculture 2010 conference was held in Papeete, French Polynesia in December 2010. The conference included a session on aquatic animal health and a workshop on health management for tropical island aquaculture. The workshop, chaired by Drs Franck Berthe and Ingo Ernst, discussed challenges associated with aquatic animal health management for tropical island aquaculture and possible approaches to address those challenges. An outcome from the workshop was agreement on a concept paper titled "*Strengthening aquatic animal health management capabilities in Pacific Island Countries and Territories*". The concept paper proposes that previous efforts to improve capabilities have been on an ad hoc basis and at an insufficient scale to make lasting and significant impacts regionally, and that a coordinated regional approach to aquatic animal health is required to support sustainable aquaculture development. The concept paper was considered at the 7th Secretariat of the Pacific Community Heads of Fisheries meeting in February 2011 where it received strong support.

In its 2010 meeting report, the AG noted that proficiency testing programs are highly desirable for national diagnostic and service laboratories. In its assessment of progress toward implementation of the technical guidelines the AG reported that: 1) ad hoc laboratory proficiency testing programs have been run; but 2) there is limited or no access to ongoing laboratory proficiency testing programs. A proposal to implement a regional aquatic animal health laboratory proficiency testing program was developed following the 2010 AG meeting and has been funded by the Australian

Government Department of Agriculture, Fisheries and Forestry (DAFF). The project will be implemented with the cooperation of DAFF, NACA and the CSIRO Australian Animal Health Laboratory. The project aims to:

1 strengthen Asia's regional capability to diagnose important aquatic animal diseases that impact on trade, industry sustainability and/or productivity
2 train participating laboratory personnel in diagnostic standards, and proficiency testing procedures, and to provide technical assistance to improve laboratory performance
3 establish a laboratory proficiency testing program that meets regional needs.

Up to 10 diseases will be included in the program (determined by participants). There will be 4 rounds of testing commencing in 2013. National diagnostic laboratories from NACA member countries will be invited to participate.

RECOMMENDATIONS

- The AG suggested that the case study of Australia dealing with mortalities of Pacific oysters be properly written up and disseminated in the region so as to raise awareness on the importance of disease preparedness and contingency planning.
- The AG was very pleased to note the approval of funding support from Government of Australia for implementing a regional laboratory proficiency testing programs for key OIE listed diseases in the region.
- On Laboratory Proficiency Testing, the AG indicated that some details in the implementation of the programme should be worked out carefully by collaborating partners including identifying of participants, logistics, and ensuring confidentiality.

4.2. SEAFDEC AQD FISH HEALTH ACTIVITIES: PROGRESS AND UPDATES

Dr. Edgar Amar presented SEAFDEC AQD's Fish Health Programmes. The Government of Japan-Trust Fund Project "Accelerating Information Dissemination and Capacity Building in Fish Health Management in Southeast Asia" is being implemented from 2010 to 2014 with two components: 1) accelerating awareness, and 2) innovative research. For component 1, a survey was conducted to know the status and needs of aquatic animal health care in small-scale aquaculture in the region. Survey/observation trips together with the surveillance and on-site training was conducted on 6-10 December, 2010 in Myanmar, and on 10-17 October 2011 in Lao PDR. Twenty farmer-respondents were interviewed in Myanmar and Lao. An AquaHealth online course was implemented from July-December 2010 with 4 GOJ-funded participants from Cambodia, Myanmar, Philippines and Thailand. Following the survey in Myanmar and Lao, parallel surveys were undertaken in the Philippines and Vietnam. The survey of farmer-respondents and active surveillance of parasite fauna of economically important freshwater was completed together with the conduct of Freshwater Fish Heath Management Training Course with emphasis on zoonotic parasites on 06-10 December 2010 (Myanmar) and on the last quarter of 2011 in Lao PDR. Sampling conducted in the 4th Quarter of 2010 in Myanmar, in the 1st quarter of 2011 in the Philippines, and 4th quarter of 2011 in Lao PDR showed that tissue filtrates from fish samples yielded negative results for zoonotic parasites.

For the research component, the following activities are on-going:

- Molecular diagnosis and prevention of economically important viruses in fish and shrimps.
- Establishment of immunization regimen for the prevention of viral nervous necrosis (VNN) in high value marine broodfish.
- Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish.
- Evaluation of carriers for practical delivery of 'vaccines' to shrimp and other crustaceans. 1. Field trial with formalin killed 'vaccine'.
- Studies on parasitic and shell diseases of abalone (*Haliotis asinina*) in the Philippines.

Other research activities and outputs include: Epidemiological Study on WSSV; Antimicrobial Activity of Commonly Cultivated Seaweeds; Molecular Markers for Seaweed Resistance to 'ice-ice' disease; Fish Health Diagnostic Services

(passed the Ring Testing for shrimp pathogens conducted by the University of Arizona); and 2nd Edition of the Fish Health Management Textbook was published.

RECOMMENDATIONS

- AG recommended that SEAFDEC AQD report to the NC/Aquatic Focal Point in the Philippines (Dr. J. Somga) the disease findings in research/surveys once the pathogen is confirmed, as well as results from diagnostic services to include mainly samples submitted by farmers for diagnosis of particular diseases (e.g. parasitic diseases of abalone, WSD, IHHN, VNN).
- Considering the large number of capacity building activities conducted by SEAFDEC AQD, the AG suggested that NACA and AQD cooperate in identifying target countries and participants so that there is synergy in regional capacity building

4.3. ACTIVITIES OF IAAHRI ON AQUATIC ANIMAL HEALTH

Dr. Leaño presented the report of AAHRI on behalf of Dr. Temduong Somsiri (Director). IAAHRI which is under the umbrella of the Department of Fisheries, Thailand, is responsible to undertake research relating to diseases of economically important aquatic animal species, to provide aquatic animal health diagnostic services, to conduct disease surveillance and monitoring, to issue Health certificates, and to conduct training. The institute is also a reference laboratory for EUS, and ISO/IEC Certified for *Streptococcus*, KHV, SVCV, *Aeromonas salmonicida* and marine shrimp diseases. IAAHRI provides disease diagnosis and issuance of health certificates to farmers free of charge. A total of 7,323 certificates were issued in 2010, and the top 5 destination countries were (in descending order) USA, China, Japan, Poland and Singapore.

Update on the recent activities of ANAAHC was also presented. The main activity for this year was the holding of the Regional Training for Capacity Building in Laboratory Diagnosis and Surveillance Program for IMNV in ASEAN Member Countries. This was co-organized by FAO, DOF Thailand and AAHRI. The training was held in Banten Province, Indonesia on 17-21 October 2011 and was attended by a total of 12 participants from 10 ASEAN member countries. Experts who facilitated the training were Dr. Puttharat Baoprasertkul (IAAHRI) and Dr.Visanu Boonyawiwat (Kasetsart University). Outputs of the training include updates on the current status of IMNV in ASEAN countries, formulation of regional standard method of RT-PCR technique for IMNV diagnosis, IMNV surveillance plan for each member country, and strengthened cooperation among member countries in dealing with the disease problem.

DISCUSSION

- A detailed output and recommendations on the completed IMNV Regional Training is needed, as this disease is still considered as the current threat in *Penaeus vannamei* industry in the region.

RECOMMENDATION:

- The AG suggested that the list of trained scientists be made available to national CAs so that their expertise could be used in national surveillance programs for IMNV. This is very important since IMNV is presently only reported from Indonesia and other countries need to be on constant watch for this pathogen

SESSION 5: DISEASE REPORTING

5.1. QAAD REPORTING - NACA

Dr. Leaño presented the current status of QAAD reporting of Asia and the Pacific Region from the 3rd quarter of 2010 to the 2nd quarter of 2011. A total of four reports were published with an average of 15 reports (out of 21 participating governments) received every quarter. More and more countries have been employing level III diagnosis, from 5 countries in 1998 to at least 12 countries at present. The following member countries are not submitting the quarterly report: China (since 2004); Korea, DPR (since 2000); Pakistan (since 2008).

The reports are widely disseminated through printed copies or e-copies downloadable at NACA website. QAAD also serve as early warning system for some emerging diseases of worldwide significance, e.g. are KHV, AVM, WTD and NHP which were initially listed in QAAD and are now listed in OIE. Aquatic animal health surveillance in the region through QAAD has been a useful mechanism for recognizing existing and emerging diseases. The published QAAD reports have generated important information on aquatic animal diseases that are present or absent in the different areas of the region.

5.2. QAAD Reporting, OIE Representation in the Asia-Pacific, Tokyo

Dr. Hnin Thidar Myint presented the progress report on disease reporting at OIE Representation in the Asia-Pacific. Total of 21 out of 24 countries in Asia Region sent their QAAD reports to OIE Asia-Pacific Office during July 2010 to June 2011. Among them, Chinese Taipei, Japan, New Caledonia, New Zealand and French Polynesia are sending reports only to OIE. Regular QAAD reports from 14 countries and irregular reports from 7 countries were received while Bhutan, Fiji and Pakistan did not send any report.

OIE Asia-Pacific office has published the QAAD Report for every quarter, however, publication of annual report for 2010 is still pending because of earthquake and tsunami in Japan in March, and relocation of regional office to Tokyo University campus in April 2011.

Among the OIE-listed diseases in Aquatic Animals, WSD, IHHN and KHD were major diseases reported in Asia Pacific Region for 2010. VER was also listed in major diseases of the region. Reported diseases of importance are Streptococcal Infection, CCV, HPV, and CyHV-2(GFHNV) for Malaysia, OSHV-1 for New Zealand and Australia, and infection with *Candidatus Xenohalioris californiensis* for Japan.

Singapore, French Polynesia and Chinese Taipei reported the introduction of new aquatic animal health regulations during the reporting period.

QAAD report will be continued until the OIE/NACA Regional Core is completed.

5.3. New OIE Disease List

Dr. Barry Hill made a short update on the OIE list of aquatic animal diseases. Epizootic ulcerative syndrome is proposed to be delisted and asked member countries to to provide full assessment using the delisting criteria and supporting documentation. Aside from this, there was no change in the current list of diseases except for Gyrodactylosis where name was changed to “Infection with *Gyrodactylus salaris*”. Ostreid herpesvirus (OsHV-1), as emerging disease, has also been brought to the attention of member governments for comments.

5.4 Revisions to the QAAD list

Revisions to the QAAD list are carried out annually by the AG. Such revisions consider the changes made to the OIE list plus diseases of regional concern and other emerging diseases. The AG deliberated on this in detail and made the following recommendations. The list of diseases for QAAD reporting for 2012 is presented in Annex C.

Recommendations

- The AG recommended that the name change made for Gyrodactylosis as Infection with *Gyrodactylus salaris* (included in the List of Diseases Presumed Exotic to the Region), be reflected in the QAAD list of diseases for 2012.
- The AG considered the importance and significance of AHDNS in shrimps and scale-drop syndrome in marine finfish, but decided not to list them at this stage as both were found not to be meeting the regional listing criteria. However, the AG recommended that members increase surveillance for these conditions and include them in their reports under any other diseases to support collation of epidemiological information for the region
- AG also recommended to make a follow-up action on Akoya Oyster Disease (being reported from Japan) with regard to the causative agent(s) involved.

5.5. PROGRESS IN THE IMPLEMENTATION OF OIE/NACA WAHIS REGIONAL CORE

Drs. Barry Hill and Eduardo Leaño made short comments on the progress of OIE/NACA WAHIS Regional Core which is now under pilot-testing in five countries. However, no updates and feedbacks have been received yet from the participating countries. The WAHIS Regional Core will be finalized once feedbacks from the pilot testing activity are received. This will then replace the printed QAAD reporting in the region once fully implemented.

RECOMMENDATIONS

- The AG recommended that the paper based QAAD will continue till the online OIE/NACA WAHIS regional core become functional and operational.
- The list of regional diseases to be included in the regional core will be decided by the AG on an annual basis.

SESSION 6. EU-ASEM AQUACULTURE PLATFORM

Dr. John Bostock presented an overview of the EU-ASEM Platform, in particular the Work Package 5 on Diseases and Health Management.

Disease remains a major challenge to profitable and sustainable aquaculture production across most species and system. The global trade in seafood adds to additional risks with respect to disease transfer and the spread of zoonosis. Governments and consumers have high expectations on Aquatic Animal Health Professionals to deliver effective and timely answers with limited funding, whilst industry are often buying whatever remedy is offered on the market rather than investing in research for long-term solutions. Greater interdisciplinary collaboration, improved access to knowledge and learning, and reduction of unnecessary duplication effort are still the ways to face the current challenges on aquatic animal health. Barriers to achieve these, however, include language, culture (institutional as well as social), geography and technology.

The ASEM Aquaculture Platform is an initiative funded by the European Union to help overcome these barriers and promote collaboration and knowledge sharing between Europe and Asia. With respect to Aquatic Animal Health (Work Package 5), the following activities have been implemented or on-going:

- Europe-Asia Steering Group on Aquatic Animal Health established;
- Formal mechanisms for utilizing the networks and expertise in both regions have been established;
- Resource document of aquatic animal health networks and initiatives in Europe and Asia published;
- Monthly Newsletter initiated and published online;
- Discussion forum activated;
- Facilitation and utilization of expertise for development of joint research, training and development activities.

For more information on the programme, please visit www.asemaquaculturehealth.net.

RECOMMENDATIONS

- The AG recommended that the AqASEM could assist in developing guidelines for enhanced compliance to EU Live Fish Import Requirements. This could be widely circulated through the different network links.
- The AG suggested that tie-up training programs should be organized in the region to address priority needs which might include:
    - Epidemiology and disease surveillance
    - Pathology master course (histopathology)

(Note: Selection of the right person to attend the training programmes/workshops should be resolved).

- Cross-country research programmes should be promoted (e.g VNN).
- Sharing of resource materials (including digital microscopy).

SESSION 7. IMPLEMENTATION OF FAO/NACA TG ON RESPONSIBLE MOVEMENT OF LIVE AQUATIC ANIMALS; OTHER MATTERS

7.1 PROJECT PROPOSAL: REVIEW OF UPTAKE OF EMERGENCY AQUATIC ANIMAL DISEASE PREPAREDNESS AND RESPONSE, WITH EMPHASIS ON IMPLEMENTATION CONSTRAINTS AND ISSUES

Dr. Brett Herbert presented the project proposal which was prepared during his 2-week placement at NACA Secretariat. The proposal aims to deliver the following outputs:

1 Training on EAAD preparedness through a learning component, involving invited expert speakers in aquatic animal disease response (OIE, FAO, regional NACA member country input, DAFF emergency management personnel, others as suggested by AG).
2 Assessment of the status of EAAD preparedness and response arrangements in NACA member countries and their progress toward implementation of the relevant Asia regional technical guidelines
3 An assessment of constraints to implementation of coordinated response to emergency aquatic animal disease events, particularly common constraints for NACA member countries.

Please refer to Annex D for complete copy of the project proposal.

RECOMMENDATION

- AG agreed on Aims and Proposed Outputs of the draft proposal, and requested NACA to finalize the proposal for submission to funding agencies.

7.2. DATE OF NEXT MEETING

The next AGM (AGM 11) will be held in Bangkok, Thailand in November 2012.

SESSION 8: PRESENTATION OF MEETING REPORT AND CLOSING

The list of AG Recommendations was revised and adopted, and the meeting closed.

ANNEX A: MEETING AGENDA

10TH MEETING OF ASIA REGIONAL ADVISORY GROUP ON AQUATIC ANIMAL HEALTH (AGM 10)

19-20 NOVEMBER 2011, MANGALORE, INDIA

DAY 1 (19 NOV. SATURDAY)

09:00 – 12:00

Opening Session

- Welcome address: **Dr. K.M. Shankar**, Dean, CF-KVAFSU
- Opening remarks: **Dr. A.E. Eknath**, Director General, NACA
- Introduction and expected outcome: **Dr. E.M. Leaño**, Coordinator, Aquatic Animal Health Programme, NACA

(**Dr. Ingo Ernst**, AG Chairman, will take over)

Session 1. Progress Report since AGM-9 (Dr. E.M. Leaño, NACA)

- Discussions and recommendations

Session 2. OIE Standards and Global Issues

- Outcomes of recommendations from OIE General Session and the Aquatic Animal Health Standards Commission (**Dr. Jie Huang**, AAHSC, OIE)
- Updates on aquatic animal health activities of FAO (**Dr. Rohana Subasinghe**, FAO)
- Discussions and recommendations

Group Photo

13:30 – 17:00

Session 3. Review of Regional Disease Status

- IMNV and other emerging threats on crustaceans (**Dr. Tim Flegel**, Mahidol University)
- Updates and emerging threats on finfishes (**Dr. Siow Foong Chang**, MSD Aquatic Animal Health)
- Discussions and recommendations

Session 4. Reports on Aquatic Animal Health Programmes from Partner Agencies

- DAFF Australia (**Dr. Ingo Ernst**, DAFF)
- SEAFDEC Aquaculture Department, Philippines (**Dr. Edgar Amar**, SEAFDEC AQD)
- Aquatic Animal Health Research Institute, Thailand (**Dr. Temduong Somsiri,** IAAHRI)
- Discussions and recommendations

19:00

Welcome Dinner

DAY 2 (20 NOV. SUNDAY)

09:00 – 12:00

Session 5. Disease Reporting

- QAAD Reporting: 2010 List and status of reporting (**Dr. Eduardo Leaño**, NACA and **Dr. Hnin Thidar Myint**, OIE Tokyo)
- New OIE Disease List and revisions to the QAAD List for 2012 (**Dr. Barry Hill**, AAHSC, OIE)
- Updates on OIE-NACA WAHIS Regional Core: Status of Pilot-testing and Plans for full implementation (**Dr. Barry Hill**, OIE)
- Discussions and recommendations

Session 6. EU-ASEM Platform

- C/o **Dr. John Bostock**

13:30 – 15:00

Session 7. Implementation of FAO/NACA TG on Responsible Movement of Live Aquatic Animals

- Project Proposal: Review of uptake of emergency aquatic animal disease preparedness and response, with emphasis on implementation constraints and issues (**Dr. Brett Herbert**, DAFF)
- Other Projects and prospects: status (**CV Mohan**, NACA)
- RRE's, RRC's and RRL's (if any)
- Other matters

15:00

Session 8. Closing

- Adoption of Report and Recommendations

ANNEX B: LIST OF PARTICIPANTS

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ANNEX C: LIST OF DISEASES IN THE ASIA-PACIFIC

QUARTERLY AQUATIC ANIMAL DISEASE REPORT

(BEGINNING JANUARY 2012)

1. DISEASES PREVALENT IN THE REGION	
1.1 FINFISH DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Epizootic haematopoietic necrosis	1.Grouper iridoviral disease
2. Infectious haematopoietic necrosis	2.Viral encephalopathy and retinopathy
3. Spring viraemia of carp	3.Enteric septicaemia of catfish
4. Viral haemorrhagic septicaemia	
5. Epizootic ulcerative syndrome	
6. Red seabream iridoviral disease	
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. Akoya oyster disease
3. Infection with abalone herpes-like virus	3. Acute viral necrosis (in scallops)
1.3 CRUSTACEAN DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Taura syndrome	1. Monodon slow growth syndrome
2. White spot disease	2. Mikly haemolymph disease of spiny
3. Yellowhead disease	
4. Infectious hypodermal and haematopoietic necrosis	
5. Infectious myonecrosis	
6. White tail disease (MrNV)	
7. Necrotising hepatopancreatitis	
1.4 AMPHIBIAN DISEASES	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with Ranavirus	
2. Infection with *Batracochytrium dendrobatidis*	
2. DISEASES PRESUMED EXOTIC TO THE REGION	
2.1 Finfish	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infectious salmon anaemia	1. Channel catfish virus disease
2. Infection with *Gyrodactylus salaris*	
2.2 Molluscs	
OIE-listed diseases	**Non OIE-listed diseases**
1. Infection with *Bonamia ostreae*	
2. Infection with *Marteilia refringens*	
3. Infection with *Perkinsus marinus*	
4. Infection with *Xenohaliotis californiensis*	
2.3 Crustaceans	
OIE-listed diseases	**Non OIE-listed diseases**
1. Crayfish plague (*Aphanomyces astaci*)	

ANNEX D: DRAFT PROJECT PROPOSAL

REVIEW OF EMERGENCY AQUATIC ANIMAL DISEASE PREPAREDNESS AND RESPONSE WITH EMPHASIS ON IMPLEMENTATION CONSTRAINTS AND ISSUES

AIM

To develop a proposal to review emergency aquatic animal disease preparedness in NACA member countries in line with implementation of the Asia Regional Technical Guidelines [1] which address emergency animal disease.

BACKGROUND

Effective emergency aquatic animal disease (EAAD) response in the early stages of a disease outbreak, or in the event of a new area becoming infected, is critical to mitigate the effects of the outbreak, reduce economic and social damage, and allay concerns of trading partners about the ability of the combatant jurisdiction to manage the outbreak in a manner that maintains the sanitary safety of traded aquatic animal products.

There have been a number of initiatives in the Asia-Pacific region which have aimed to support the management of EAADs. The *'Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals* and the *Beijing Consensus and Implementation Strategy'*[1] (Asia Regional Technical Guidelines), the supporting 'Manual of Procedures' and the 'Asia Diagnostic Guide' were developed through consensus building and consultations and adopted by NACA member countries in 2000-2001. The Asia Regional Technical Guidelines provide a framework for building aquatic animal health capabilities in the region, including a range of capabilities that directly support effective emergency disease responses. The *Asia Regional Advisory Group on Aquatic Animal Health* (AG) is an expert group established under the auspices of the Network of Aquaculture Centres in Asia Pacific (NACA) to provide advice to Asian governments in implementing (and monitoring implementation) the Asia Regional Technical Guidelines and aquatic animal health issues within the Asia-Pacific region. The AG recognises that the Asia Regional Technical Guidelines are the principle, regionally agreed approach to building aquatic animal health capabilities in the region.

Effective EAAD response arrangements require a range of capabilities to enable authorities and aquatic animal industries to detect, respond and recover from disease outbreaks. These capabilities encompass awareness, diagnosis, surveillance, reporting, diagnostic capability, contingency planning, institutional arrangements for decision making, response capabilities (e.g. quarantine, destruction, decontamination and disposal) and others. Contingency planning is a core component of EAAD preparedness that provides the mechanism for rapidly and effectively drawing together numerous capabilities and resources for an effective response.

The AG has identified that while the exact status of contingency planning in individual countries is not certain, there are gaps in implementation of contingency planning, and training in emergency management frameworks may be useful. Contingency planning may assist to identify weaknesses in early detection and response frameworks. Support for developing contingency plans for a particular disease threat may be a good first point in developing this capability in the region given the threat of the spread of IMNV and KHV further than their current reported range.

Mohan and Phillips (2005) identified only three of the 21 countries participating in the regional aquatic animal health program of NACA as having good contingency planning in place. The massive and costly aquatic animal disease events that have spread throughout Asia-Pacific since the late 1980s have demonstrated the need for EAAD preparedness and response throughout the region to reduce their impacts. Awareness and knowledge of EAADs is high, due to several projects aimed at providing the tools to develop EAAD response plans and frameworks in the region. However, to date large scale, costly disease outbreaks, particularly in *Penaeus monodon* and *Litopenaeus vannamei* farming, have suggested that implementation of coordinated disease response is lacking, even though the tools, skills and resources to manage outbreaks may be present. Lack of or inability to implement contingency plans may contribute to this lack of adequate disease response.

PREVIOUS TRAINING IN AQUATIC ANIMAL HEALTH PREPAREDNESS AND RESPONSE IN THE REGION.

Several projects to address the issue of preparedness and response plans for aquatic animal disease (AAD) in the region have been completed. These were initiated in response to the KHV outbreak in Indonesia in 2002 and the history of prawn viral diseases and EUS which spread throughout the Asia-Pacific over the late 1980s and 1990s. These projects aimed to provide tools for participants to develop effective national systems for EAAD management.

The FAO guidelines on preparedness and response to AAD emergencies in Asia (Arthur et al 2005) were published after an FAO workshop in Indonesia (Subasinghe and Arthur 2005). They are an excellent resource for developing national response capability. It is not clear if these guidelines have been used or implemented in the region.

Technical missions to Vietnam, Cambodia, Lao PDR and Myanmar (Strengthening Aquatic Animal Health Capacity and Biosecurity in ASEAN - AADCP-RPS 370-021) assisted these countries to draft and develop plans for aquatic animal health management, including for emergency preparedness and response. These workshops involved many participants from all levels and sectors of government, education and industry. Additional policy and training workshops were also held as part of this project. Comprehensive, practical plans were drawn up. These plans were agreed upon by all sectors involved in the workshops. They were specifically developed for use in the country under that country's conditions and within their systems. Capacity limitations and ways to address them were identified. Issues with development of national systems were identified and means of alleviating these proposed. However, it is not clearly known how effectively these programs have been implemented or the constraints to implementation.

Mohan et al (2008) found that implementation of contingency planning in the region still remained rather limited. The reasons for this, particularly where the institutions and infrastructure are present and functional, are not clear.

While tools have been delivered for development of effective preparedness and response in the region, it also appears as though implementation in some countries has been constrained. Assessment of where countries are in implementation of preparedness and response strategies, the constraints they face in implementation, and how to address those constraints is required.

PROJECT PROPOSAL: Review of Emergency Aquatic Animal Disease Preparedness with Emphasis on Implementation Constraints and Issues

The major project activity would be a workshop of representatives from NACA member countries. The workshop would aim to deliver the following outputs.

PROPOSED OUTPUTS:

1. Training on EAAD preparedness through a learning component, involving invited expert speakers in aquatic animal disease response (OIE, FAO, regional NACA member country input, DAFF emergency management personnel, others as suggested by AG).
2. Assessment of the status of EAAD preparedness and response arrangements in NACA member countries and their progress toward implementation of the relevant Asia regional technical guidelines
3. An assessment of constraints to implementation of coordinated response to emergency aquatic animal disease events, particularly common constraints for NACA member countries.

PROPOSED OUTCOMES FOR DISCUSSION AND CONSIDERATION BY AG

1. Identification of progress of member countries in developing national plans that support the development of EAAD preparedness and response capabilities and determine the types of support needed to assist them (consistent with Asia regional technical guidelines).
2. Identification of high priority common regional needs that would improve regional response arrangements.
3. Member countries develop and share ideas and approaches of other countries in the region, consistent with OIE guidelines.
4. Understanding of constraints for implementation of EAAD response common across the region, and measures that could be taken to remove or reduce these where possible and practical.

5. Consideration of generic emergency aquatic animal disease response strategies that could be tailored by and for each participant country.
6. An agreed regional strategy for dealing with disease emergencies to be coordinated by NACA (e.g. issuing regional alerts/advisories, fielding regional emergency assistance missions, creating emergency assistance fund)

The OIE Standards and Trade Development Facility is a potential source of funding for this workshop. It supports capacity building to assist member countries to meet OIE standards. This facility also can support short term funding for exploratory projects to identify issues.

The FAO Fisheries and Aquaculture Department has indicated willingness to support the implementation of the Asia Regional Technical Guidelines. Determining the limitations for implementation of contingency planning in NACA countries, and investigating means of overcoming them, is essential to enable implementation and improvement of EAAD preparedness and response arrangements in the region.

JUSTIFICATION

The NACA Asia Regional Technical Guidelines (TG) provide the most comprehensive framework available for regional development and implementation of national strategies to address aquatic animal health issues. These were completed some ten years ago and assessment of implementation of the guidelines is needed. An ASEAN Australia Development Cooperation Program project conducted several technical missions to assist countries to develop disease preparedness and response in 2005-2006. These projects focused on national aquatic animal health management plans, and resulted in preparation of national strategies for four ASEAN countries. Other ASEAN countries have plans either under development or already in place (Mohan et al 2008). Assessment of what elements of the plans have been adopted, what has been implemented, and what is working is required to determine the extent of adoption and the strategies that work in specific circumstances.

Effective implementation of the NACA technical guidelines is necessary to help limit the further spread and dissemination of damaging emergency aquatic animal diseases throughout the region.

As Mohan et al (2008) recognised, implementation of plans still remains an issue in many countries throughout the region. A meeting of NACA members to review the uptake of disease management strategies is required. Identification of the common factors constraining development and implementation of emergency disease preparedness strategies is needed. A workshop to identify the barriers and restrictions on adoption of national plans, and then for members to identify means of overcoming these or taking a staged approach will be a first step towards improved uptake and implementation of effective EAAD preparedness and response measures.

PROPOSED METHOD

Participants: As the workshop is aimed at identifying and alleviating constraints to implementation, high level managers responsible for resource allocation and oversight of programs, and operational staff (the National co-ordinators) who contribute to planning, are needed to ensure that actions can be taken in line with increased understanding of the importance on EAAD planning. At least two staff from each country should attend.

Presenters/facilitators: One expert each from FAO, OIE and several specialists from Australia and Thailand (where plans are already in place and are implemented), and other specialists as identified by AG members and NACA.

Organisation and venue: NACA has extensive experience in organising and running workshops. Malaysia or Vietnam are potential lower cost venues for running a meeting.

Funding: to enable participation it is proposed that costs associated with the workshop be funded from the project. As discussed above, both OIE and FAO are potential donor agencies. The initial contact would be decided after consideration of the proposal by the AG.

Content: A revision of what has been done and resources available will be necessary as in the six years since the technical missions and FAO projects many of those who participated in those processes are no longer involved in EAAD response in their country.

1. Recap on emergency disease preparedness, previous projects, and what it involves (many elements). Potential FAO speaker.
2. Systems already in place and how they work. May emphasise coordination aspects.
    - Thailand
    - Australia
    - India
3. Work through elements of emergency preparedness (see below) to determine where each country is at-elements as identified in FAO guidelines, TM reports, other.
4. Identify the constraints across the region OR work out how to identify the constraints.
5. Once constraints are identified determine the actions needed to address them
    - Identify where possible in-country approaches are appropriate (institutional, cultural etc)
    - Assistance (form and resourcing)
    - Regional lead (NACA role)
6. Potential follow on activities-how to address constraints-stakeholder driven, regional issues more likely to gain traction

A follow up plan must be a part of this-previous things such as TM, workshops etc have not been reviewed to see if they worked. For future programs investigation of impact after the conclusion of the project in needs to be built in.

ATTACHMENT A:

Elements of disease preparedness

- Awareness
- Diagnosis
- Surveillance
- Reporting
- Diagnostic capability
- Contingency planning
- Institutional arrangements response capabilities-containment, quarantine, decontamination
- Communication pathways
- Pre-agreed plans and responsibilities