



**OIE Regional Workshop
on Emergency Aquatic Animal Disease Response
in collaboration with NACA
Bali, Indonesia, 6-8 November 2013**

Summary Report



OIE Regional Representation for Asia and the Pacific

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Summary

The OIE Regional Workshop on Emergency Aquatic Animal Disease Response was organised in Bali, Indonesia from 6 to 8 November 2013, in collaboration with Network of Aquaculture Centres in Asia-Pacific. Total of 35 participants including country representatives from Bangladesh, China PR, India, Indonesia, Japan, Korea RO, Myanmar, Philippines, Sri Lanka, Thailand and Vietnam attended the workshop. The programme for the first two days of the workshop was dedicated by country reports on current aquatic animal disease situations in the selected countries and presentations on the national aquatic animal health programmes of China, Japan and Korea. In addition, case studies on the molluscan diseases (Akoya Oyster Disease and Soft Tunic Syndrome), shrimp diseases (Acute Hepatopancreatic Necrosis Syndrome, AHPNS) and finfish diseases (Koi Herpes Virus) were presented to facilitate the subsequent discussion on emergency response of those diseases in the national and regional level.

Dr Pudjiatmoko, Chief Veterinary Officer of Indonesia, acknowledged OIE for organising the timely workshop on EAAD Response since the shrimp culture in some countries in Asia was severely hit by the outbreaks of AHPNS recently. Dr Kugita, Regional Representative for OIE Regional Representation for Asia and the Pacific, also mentioned in his welcomed remarks that OIE National Focal Points for Aquatic Animals and NACA National Coordinator from selected countries are invited to this workshop to improve national coordination between themselves, while creating a network with other key players in the region.

The workshop highlighted the importance of Asia-Pacific region in provision of protein-based food to global population since it covers the 90% of global aquaculture production while having the diversified aquaculture system and huge numbers of aquatic animal species. Consequently, there is a high risk of the transboundary spread of aquatic animal diseases by the trade-related movement of live aquatic animals. The participants were reminded that “prevention” is the best way to protect the aquatic animals from the diseases. This might be achieved by a combination of various efforts such as sharing information of disease situation, conducting import risk analysis according to the OIE Codes and Manuals, application of OIE PVS Tool:Aquatic and TG, and implementation of Best Management Practices (BMPs) and Good Aquaculture Practices (GAPs) as a part of National Aquatic Animal Health Programmes. Taking into account the huge economic impact of recent outbreaks of emerging diseases in the region, for instance for AHPNS, the workshop recommended the need of international interventions for the improvement of capacity building activities and application of international standard and guidelines for the emergency disease response. The workshop also informed the member countries to be encouraged to apply the OIE PVS tool:Aquatic to improve their national aquatic animal health management programmes.

The workshop was successfully completed with the visit to the Institute for Mariculture Research and Development (IMRAD) and PT Suri Tani Pemuka Hatchery for Marine Fish (JAPFA), Gondol.

The OIE appreciates the Ministry of Agriculture and Ministry of Marine Affairs and Fisheries, the Government of Indonesia for hosting the workshop.

Introduction

The OIE and Network of Aquaculture Centres in Asia-Pacific (NACA) have been cooperating for many years, particularly in the area of aquatic animal disease reporting through the Quarterly Aquatic Animal Disease (QAAD) reporting system in Asia and the Pacific region that started in 1998. A Memorandum of Understanding between NACA and OIE was signed in 2008 to strengthen the ongoing collaboration, including the functioning of the NACA Advisory Group, to set up and operationalise a WAHIS OIE/NACA Regional Core and to undertake capacity building for implementation of WTO-SPS measures and OIE standards. OIE RRAP has been invited to various meetings/workshops organised by NACA and given opportunities to talk about OIE's work, and vice versa. The two organisations jointly organised a workshop on Aquatic Animal Health in March 2008.

Members of the OIE Aquatic Animals Health Standards Commission (formally the Fish Disease Commission) were also involved in development of “FAO/NACA Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals and the Beijing Consensus and Implementation Strategy (TG)” and the “Manual of Procedures” published in 2000. The TG provides guidance on institutional frameworks for national and regional efforts for reducing the risks of disease spread due to trans-boundary movement of live aquatic animals. The combined application of OIE standards and TG is an effective means to improve national aquatic animal health.

Recent spread and outbreaks of aquatic animal diseases in the region, such as Acute Hepatopancreatic Necrosis Syndrome (AHPNS) in shrimp and Koi herpesvirus disease in fish, clearly demonstrate the vulnerability of the aquaculture industry as well as wild populations of aquatic animals to disease emergence in the region. The impact of these diseases has been exacerbated by the lack of effective preparedness and response when diseases emerge. Jointly identifying constraints to effective application of appropriate sanitary measures, in particular during major new disease outbreaks, will help to develop national strategies for responding to emergency disease events and constructing a coordinated approach among neighboring countries, which would improve aquatic animal health standards in the Region by reducing risks associated with movements of aquatic animals and their products.

Taking into account of above-mentioned issues, the Regional Workshop was organised with the following objectives:

- To identify the factors that constrain regional members' abilities to apply appropriate sanitary measures to protect aquatic animal health;
- To raise awareness of OIE standards including standard setting procedures, OIE Aquatic PVS as well as FAO/NACA Asian Regional Technical Guidelines to support capacity building of members' effective application of those standards and guidelines;
- To inform participants about the OIE/NACA regional core for better reporting and information sharing; and
- To help improving national coordination between OIE Focal Point and NACA National Coordinator which are not necessarily the same.

Summary of Presentations

Note: All the presentation materials can be found through this link < <http://www.rr-asia.oie.int/activities/regional-programme/aquatic-animal-health/activities/2013-naca/presentation/> >.

Organisational Presentations

OIE Aquatic Animal Health Code and Manual of Diagnostic Tests for Aquatic Animals (Dr Hnin Thidar Myint)

One of the OIE objectives is to safeguard world trade by publishing health standards for international trade in animals and animal products. The Aquatic Animal Health Code (the Aquatic Code) sets out standards for the improvement of aquatic animal health and welfare of farmed fish worldwide, including through standards for safe international trade in aquatic animals (amphibians, crustaceans, fish and molluscs) and their products. The purpose of the Manual of Diagnostic Tests for Aquatic Animals (the Aquatic Manual) is to provide a standardised approach to the diagnosis of the diseases listed in the Aquatic Code, and to facilitate health certification for trade in aquatic animals and aquatic animal products. The development of these standards and recommendations results from the ongoing work of the OIE's Specialist Commissions and the OIE Aquatic Animal Health Standards Commission (Aquatic Animals Commission). Recent updates on Aquatic Code include the adoption of New Chapter 7.4. Killing of farmed fish for disease control purposes during the 81st General Session.

The meeting of Aquatic Animals Commissions in October 2013 proposed to revise the definition of emerging disease, noting that this definition excludes the diseases listed in the Aquatic Code. Considering the improved clarity on requirements for notifications and reporting emerging diseases, clarified definition for emerging diseases, and the slow mechanisms for listing an emerging disease, the Commission proposed that Article 1.2.3. 'Criteria for listing an emerging aquatic animal diseases' be deleted.

For AHPNS, the Commission considered that the available information may be insufficient to assess the disease against the criteria in Article 1.2.2. In particular, uncertainty on pathogen identity (among strains of *Vibrio parahaemolyticus*) and lack of availability of a specific diagnostic test (to differentiate the causative agent from other strains of *V. parahaemolyticus*) means that criteria for listing are unlikely to be met. In light of the proposal to delete Article 1.2.3. for listing of an emerging disease, the Commission does not consider it appropriate to list AHPNS as an emerging disease. However, the Aquatic Animals Commission agreed that the disease meets the definition of an emerging disease and that Member countries should notify the occurrence of this disease in accordance with Article 1.1.3. The Commission drafted an 'OIE Technical Factsheet on Acute Hepatopancreatic Necrosis Syndrome' with inputs from experts. This Factsheet will be uploaded onto the OIE web page and will be regularly reviewed as new knowledge becomes available.

The OIE has developed the OIE Tool for the Evaluation of Performance of Veterinary Services and/or Aquatic Animal Health Services (OIE *PVS Tool: Aquatic*) which is based on the sixth edition of the OIE PVS Tool and includes amendments to some critical competencies (CC) and Levels of Advancement so that the Tool is more appropriate for the evaluation of the performance of Aquatic Animal Health Services. Member countries are encouraged to request an Evaluation of their Aquatic Animal Health Systems.

FAO-NACA Technical Guidelines on Responsible Movement of Live Aquatic Animals (Dr Eduardo Leano)

The FAO-NACA Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals (TG) was formulated to assist countries to undertake movement of live aquatic animals in a way that minimizes the disease risks associated with pathogen transfer and disease spread, both within and across boundaries. The purposes of TG include: 1) Enhance the protection of aquatic environment and biodiversity, as well as the interest of aquaculture and capture fisheries; 2) Provide a mechanism to facilitate trade of aquatic animals; and 3) Avoid unjustifiable trade barriers based on AAH issues. The guiding principles were adopted as a regional strategy by 21 governments in the Asia-Pacific region in 2000, through NACA's Regional Aquatic Animal Health Programme. The TG identified seven major elements which need to be in place and operating effectively in trading countries, if the risk of international disease spread within the region is to be reduced:

1. Disease diagnosis
2. Health certification and quarantine measures
3. Zoning
4. Disease surveillance and reporting
5. Contingency planning
6. Import risk analysis
7. National strategies and policy frameworks

While significant progress has been made in the region, only few member governments have well-established preparedness and response measures in place especially for disease zoning, contingency planning and import risk analysis (see Table below).

Progress made by 21 member governments on the major components listed in the Asia Regional Technical Guidelines and on national strategies and policy frameworks.

Elements in the Technical Guidelines	Progress Made in Asia-Pacific (Number of Countries)		
	Good	Moderate	Low
Disease diagnosis	10	6	5
Health certification and quarantine measures	10	5	6
Disease zoning	3	3	15
Disease surveillance and reporting	8	8	5
Contingency planning	3	7	11
Import risk analysis	4	4	13
National strategies and policy frameworks	11	4	6

As such, gaps and opportunities in the implementation of TG in the region have been identified which are summarised below:

1. Disease Diagnosis
 - a. OIE twinning programs are a means to assist laboratories to develop capabilities
 - b. The exact status of diagnostic capability in individual countries is not certain
 - c. There is limited or no access to ongoing laboratory proficiency testing programs
 - d. Some areas of specialist diagnostic expertise are lacking
 - e. Network approaches are a means draw on available diagnostic expertise
2. Health Certification and quarantine measures
 - a. The importance of supporting aquatic animal health attestations through sound aquatic animal health programs continues to be underestimated, with possible ramifications for trade
 - b. Some inappropriate or illegal activities continue and threaten to spread trans-boundary diseases
3. Disease Zoning
 - a. Where common health status can be identified, restrictions on trade can be reduced
 - b. Training opportunities would be beneficial
 - c. Learn from the experience of terrestrial animal industries (e.g. poultry)
4. Disease Surveillance and Reporting
 - a. Participation could improve further – some countries report irregularly
 - b. The proposed regional core utilising the OIE's WAHID will streamline reporting and may improve participation
 - c. The exact status of individual countries with regard to adoption of national lists and supporting legislation is not known
 - d. Remains a reliance on passive surveillance. Active surveillance may be beneficial but cost is often a barrier.
 - e. Methodologies to undertake effective but low-cost active surveillance would be of assistance
 - f. Epidemiological expertise is often limited
 - g. There is a need to increase surveillance of wildlife to support health status
5. Contingency Planning
 - a. The exact status of contingency planning in individual countries is not certain
 - b. Training in emergency management frameworks may be useful
 - c. Support for developing contingency plans might usefully be directed at particular disease threats e.g. IMN
6. Import Risk Analysis
 - a. There is a need to build awareness of the concepts
 - b. Training can be abstract and disengaging - should aim at trainees learning on scenarios relevant to their circumstances
 - c. This is a high priority generic need that is suited to development of a central training program
7. National Strategies and Policy Frameworks
 - a. The exact status of national strategies in individual countries is not certain
 - b. The OIE's PVS tool provides a means of assessing the progress of individual countries

Quarterly Aquatic Animal Disease Reporting (Ms Nanae Takagishi)

The QAAD Reporting System is a joint activity between NACA and OIE Asia Pacific. The Asia Regional Advisory Group (AG) on Aquatic Animal Health regularly reviews and evaluates QAAD reports and programmes of the QAAD, and the list of disease of regional concerns. Total of 27 diseases i.e., 10 finfish diseases, 6 mollusc diseases, 9 crustacean diseases and 2 amphibian diseases are listed in the QAAD reports in 2012. The 11th AG Meeting decided to include AHPNS in the QAAD 2013. The quarterly reports submitted by 26 Member Countries are being uploaded on NACA and OIE Tokyo websites, and OIE Tokyo published the Yearbook and distributed them to Members and relevant organisations.

As the result of the analysis of QAAD reports during 2010-2012, the reports on White Spot Disease (WSD) has been reported from 15 countries and Infectious Hypodermal and Haematopoietic Necrosis (IHHN) has been reported from 10 countries in shrimps. For the finfish diseases, Viral Encephalopathy and Retinopathy (VER) has been reported from 11 countries. GID and VER widespread in Asian Pacific region affects many species of groupers that are very important species for aquaculture. Most of crustacean diseases listed in QAAD affects whiteleg shrimp and giant tiger prawn and ornamental shrimps are affected as well. Infection with *Perkinsus olseni* has been reported in 9 mollusc species and number of reporting countries has been increased from three in 2010 to six in 2013. In some cases the pathogen of this disease was detected in wild animals.

There are 3 levels of diagnosis used in QAAD reports, ranging from level 1, which uses gross observation, level 2 via histopathology to level 3, which utilizes more advanced and specific diagnosis such as molecular biology. Among 18 countries reporting their level of diagnosis, 2 countries are capable of level 1 diagnosis and 16 countries are capable of running diagnosis up to level 3.

As for the containment/control measures, using vaccine and immunostimulant, movement control and quarantine, monitoring water quality, managing health condition, using vitamins, probiotics, herbal drugs, disposal of infected animals, early/emergency harvest and disinfection procedures are reported.

About 20 member countries are submitting more than 1 report annually and approximately 15 member countries are submitting all four reports every year. Considering the importance of information provided by the QAAD Reports, member countries are encouraged to submit reports regularly, especially with the provision of better quality information.

Current Disease Trends in Aquaculture (global/regional) (Dr Eduardo Leano)

Aquaculture is one of the important sectors in the economy of most Asia-Pacific countries, and overall contributing to around 90% of the global aquaculture production. As the biggest producers, the region is also the biggest consumer of aquatic products with average per capita consumption of 43 kg/year compared to global average of only 23 kg/year. However, majority of aquaculture farms are small-scale and most often lack the necessary facilities for proper aquatic

animal health management. Aquaculture in the region is beset by many problems, and disease outbreaks are one of the serious causes of economic loss in many aquaculture operations around the region. Considering the current trends in aquaculture such as intensification and continuous diversification of culture species and farming systems, the spread of transboundary aquatic animal diseases as well as emergence of new diseases are inevitable, and will continue to cause problems in the aquaculture industry.

Some of the important transboundary and emerging aquatic animal diseases presently affecting the aquaculture industry in the region include White spot disease (WSD), White tail disease (WTD), Infectious myonecrosis (IMN) and Acute hepatopancreatic necrosis disease (AHPND) among crustaceans (mainly shrimps), and Epizootic ulcerative syndrome (EUS), Koi herpesvirus (KHV), Viral nervous necrosis (VNN) and Grouper iridoviral disease (GIV) among finfishes.

Country Presentations

Note: The template for the preparation of country report had been sent prior to the workshop. Four major issues are listed in the template: 1) Overview of AAH situation in the country; 2) Policies and regulation on AAH Management; 3) Emergency preparedness and contingency planning; and 4) The way forward.

Bangladesh (Dr Malay Sanker Dey)

Department of Livestock Services (DLS) is responsible for preventing the introduction or spread of diseases affecting aquatic animals. Major aquatic animal diseases (AADs) are Bacterial disease (Haemorrhagic septicaemia), Columnaris disease caused by *Felxibactercolumnaris*, Fungal diseases (Saprolegniosis, Branchiomycosis, Myxosporidiasis), Metazoan diseases (Monogenetic trematode infection, Black spot disease, Argulosis, Lernaeciasis and Leech infection). While all disease response situations are different, DLS conducts the initial inspection, sample collection and submission, investigation, disease confirmation, destructino/disposal, and cleaning and disinfection for the AADs response. SMS Gateway System is applied for the disease communication and disease reporting.

India (Dr I.A. Siddiqui)

Department of Animal Husbandry Dairying & Fisheries (DADF) under Ministry of Agriculture in Central Government is the competent authority for AAH regulation and management. National Surveillance Programme for AAD in shrimp, fish and molluscs has been launched in May 2013 with the funding by Ministry of Agriculture through National Fisheries Development Board (NFDB). Numbers of OIE Listed and non-listed diseases are listed as the diseases of national concerns. India submits the QAAD Reports to OIE and NACA and six-monthly reports are submitted to OIE HQs in Paris. More than 90% of shrimp/fish farmers have land holding of less than 2 ha and disease reporting system in the field level is still poor. The DADF induces number of initiatives such as establishment of aquatic quarantine facility and setting-up of network of fish/shrimp disease diagnostic laboratories for the effective implementation of disease management system.

Indonesia (Mr Maskur Maskur)

Ministry of Marine Affairs and Fisheries is the competent authority for AAH in Indonesia. During last five years, trend of production of aquatic animals and aquatic animal products is increased according with the significant increase in aquaculture while the capture fisheries remains stable. Among the aquatic commodities, seaweed shares 67%. The government established the Laws and Regulations for fisheries and aquaculture including 'Fish Quarantine Legislation' and 'Live Fish Importation'. AAH Services is not established and legislation on fish health management is in drafting stage. Indonesia receives FAO TCP Project for the development of preventive AAH protection plan and enhancing emergency response capacities to shrimp disease outbreaks. Trade Support Programme II for food safety and residue control in order to strengthening National Residue Monitoring Plan (NRMP) is also ongoing by the support of EU. The OIE Twining Programmes have been conducted with OIE Reference Laboratory of Arizona University, USA for shrimp diseases and with Japan for Koi Herpes Virus. Fish vaccines are widely applied for

controlling the bacteria and virus on finfish diseases. For emergency preparedness and contingency planning against AHPNS, Indonesia is actively participating in international meetings and workshop and is working on implementation of disease investigation and import risk analysis.

Myanmar (Dr Zaw Win)

Department of Fisheries (DOF), Ministry of Livestock, Fisheries and Rural Development is the sole competent authority for AAH and disease control in Myanmar. At present, bacterial and parasitic infections are major disease concerns. In Feb 2013, high mortality rate was observed in fresh water prawn hatcheries in two townships but any of OIE and US listed pathogens were detected according to the report from Arizona University laboratory. Poor water quality, high environmental temperature and poor handling are considered as the reasons for high mortality. Two laboratories under the DOF conduct the PCR for four shrimp viral disease such as White Spot Syndrome Virus, Infectious Hypodermal and Haematopoietic Necrosis Virus, Taura Syndrome Virus and Yellow Head Virus. Farm inspection and quarantine procedures are carried out for the exports.

Sri Lanka (Dr G.R. Arachchige)

Several Ministries have a vital role to play on AAH management. Under the Ministry of Fisheries and Ocean Resources, National Aquatic Resource and Research Agency and National Aquaculture Development Authority take responsibilities for research development and commercial aquaculture development activities respectively. The Department of Animal Production and Health, Ministry of Livestock and Rural Community Development provides the control and prevention of contagious diseases in animals, for control of export and import of animals and animal products, veterinary drugs, and veterinary biologicals. Ornamental fish industry is widely distributed and brings foreign exchanges. National and international programmes have been implemented mainly for fish diseases. Risk analysis is being carried out for imports and farm inspections are carried out prior to exports. General standard operational procedure is available for all animals but no special one for Aquatic Animals. Future plans include to establish facilities for diagnosis of all the OIE listed diseases and strengthening of diagnostic facilities for shrimp diseases.

Vietnam (Dr Le Van Khoa)

Department of Animal Health is the competent authority for the AAH management. The important AADs in Vietnam includes WSD, TSV, IHNV, APHS and Enteric Septicaemia of Vietnamese catfish. AHPNS appeared in 2010 and 29 provinces reported the AHPNS in 2012. Farmers are recommended to reduce the density of shrimp to 60-80 ind./spm, to have hatchery improvement and integrated cropping etc. In 2013, total of 14 provinces reported the AHPNS cases but mortality rate decreased by 50%. Annual training courses on AAH management and diagnosis for local key staff have been carried out and quarantine and inspection procedures are applied for imported brooders as a part of emergency response programmes. Constraints include lack of early warning system and proficiency testing programmes, poor farming practices and lack of funding.

National Aquatic Animal Health Programmes

China (Dr Dongyue Feng)

In 2012, China's aquaculture production was 42,883,600 tons which accounts for 72.59% of total output of aquatic products. China had made important contributions to world aquaculture fisheries development, and ensure the food safety, and provide high quality protein source of food.

The National Aquatic Animal Epidemic Prevention Technology Department is consisted of the National Fisheries Technology Extension Center, Aquatic Animal Disease Diagnostic Laboratory and Aquatic Animal Pathogen Library. The duty of the department includes to build national AAD prevention and control system, to develop aquaculture disease prevention plan and work plan, to organise aquaculture disease monitoring, to organise and investigate of major aquatic animal disease surveillance and epidemiology, to detect and diagnose of AAD responsible for the preparation and revision of specification, and to prepare standard substance such as diagnostic reagents.

The Local Animal Epidemic Prevention Technology Department, working with 13 provincial aquatic animal disease control center and 628 country aquatic animal disease prevention stations, is responsible for a series of technical work, such as AAD surveillance, detection, diagnosis, epidemiological investigation, reporting and other prevention and control technology. For the aquatic animal epidemic prevention and control, national AAD monitoring plan has been established. Animal Epidemic Prevention Law, Inspection and Quarantine Law and Agricultural Products Security Law are established.

Ministry of Agriculture is the management mechanism of Chinese Fishery. China had set up a "national-province-country" level monitoring network system since 2001 for the OIE-listed diseases and main disease listed in the MOA. More than 100 standards about AAD diagnose and epidemic prevention has been formulated. As having OIE Reference Laboratories on SVC, WSS and IHNN, China actively participates in the revision of OIE Code and Manual for Aquatic Animal Diseases. Moreover, "Aquatic Animal Disease Contingency Plans" have been introduced since 2005 to control the sudden, explosive of AAD and to improve rapid response capability of the treatment of AADs.

At present, China AAD prevention and control situation is still grim, and China is working to strengthen the AAH Management.

Japan (Dr Keiko Okamoto)

Various species of aquatic animals are cultured in Japan. Marine fisheries, major portion of fishery production includes seaweed, shellfish and fish with 42, 34 and 24 percent of production respectively. Eel production covers 51% of fresh water culture production followed by 24% production of salmon.

Fish and Fishery Products Safety Office under the Ministry of Agriculture, Forestry and Fisheries (MAFF) is the central competent authority which develops and improves applicable regulations and guidelines based on the laws, quarantines and issues an import permission, conducts surveillance and collect information relevant to fish diseases, gives financial and technical support to prefectural governments and reports disease occurrences to the OIE and contribute to the development of the OIE Code and Manual. Prefectural Governments are local competent authorities to conduct surveillance of farms, instruct to control diseases and disseminate necessary information to farmers and take preventive measures to the farm with the assistant of 102 fisheries experimental laboratories in 47 prefectures.

National Research Institute of Aquaculture (NRIA), Fisheries Research Agency (FRA) develops and disseminates new diagnostic technologies, research important diseases, develops medicines and vaccines, conducts definite diagnosis of specified diseases and unknown cases, and plays as the OIE Reference Laboratory. Japan Fisheries Resource Conservation Association (JFRCA), public interest incorporated association, is the authorised test agency for AADs for export and surveillance. It holds workshops to train experts of AAH management of prefectural governments and animal quarantine services with support of the MAFF, and stocks and distributes materials for examination of reagents.

Prevention measures of the disease spread in fish within Japan are based on the 'Law to Ensure Sustainable Aquaculture Production' (Law No. 51 of 1999, amendment: Law No. 36 of 2005) which stipulates to take necessary measures to prevent the spread of specified infectious diseases among farms in order to stable supply of aquatic products. Prevention measures of fish disease invasion (import quarantine) are taken based on the Fisheries Resources Protection Law (Law No. 313 of 1951, amendment: Law No. 77 of 2007). Animal Quarantine Services (AQS) are responsible for import quarantine of aquatic animals at the port and conduct diagnosis tests.

Japan has a special export programme of Nishikigoi. Farms which intend to export Nishikigoi are required to be registered by MAFF based on the Guideline that is made by MAFF in accordance with the OIE Code. Registered farms has to be taken the surveillance of specified diseases two times per year for two years, and has to have a biosecurity plan. Prefectural Governments issue the export certificate for the exportation of Nishikigoi.

The Republic of Korea (Dr Mi Young Cho)

The Republic of Korea has enacted and implemented the Aquatic Animal Disease Control Act in 2008 to protect aquatic ecosystem and supply seafood in a sustainable way. This Act also aimed at the comprehensive management of aquatic animal diseases. It was amended and renamed as the Aquatic Life Disease Control Act in 2013. The AADs which should be notified to the competent authority are RSIV, SVC, KHV, VHS, EUS, Taura syndrome, WSD, YHD and other additional 12 diseases in compliance with the ordinance of the Ministry of Oceans and Fisheries. National disease control infrastructure is established equally between border quarantine and domestic disease control.

The National Fisheries Research and Development Institute (NFRDI), consisting of headquarters, eight research institutes and seven regional centers, is the unique national research institute in charge of marine and fisheries science in Korea. As the national aquatic life disease control institute, NFRDI has a division and seven regional branches. The primary work is to support sustainable aquaculture by minimising the occurrence of aquatic life diseases through periodical surveillance of aquaculture facilities, monitoring overseas for infectious aquatic life diseases, and epidemiological investigation on infected farms.

NFRDI also contributes to establishing a scientific disease control system for aquatic life by developing internationally standardised protocols of disease diagnosis and control techniques for domestic aquaculture facilities. It also issues certificates of disease inspection of aquatic life to be released, certificates of disease inspection, and approval certificates of transplantation of fisheries organisms. NFRDI is also responsible to create and administrate the national and local disease control networks for efficient prevention of epidemics of aquatic life disease through revising the related statutes, opening disease control councils, designating and operating disease diagnosis institutions, and educating and entrusting epidemic control officers.

The National Fishery Products Quality Management Service (FiQ), consisting of headquarters and thirteen regional offices, is serving as the center of the general administration regarding fishery products. FiQ conducts border quarantine on aquatic life for import and export and on aquatic life carried by travelers. Currently, items designated for quarantine are aquatic life and aquatic life products for farming, human consumption, ornamental and research & development purposes. Quarantine is conducted on 20 diseases, which are also OIE-listed diseases. The methods used for the quarantine are document review, clinical check and laboratory test in compliance with the OIE Aquatic Manual.

FiQ also carries out many different tasks, in accordance with variety of domestic and international laws, such as the inspection of fish and fishery products for government reserves and export, management of registered establishments for export, safety investigation of domestic fish and fishery products, quality certification, geographical indication (GI), traceability, supervision and guidance on country of origin labeling, quality inspection on domestic and imported salt, cooperation in preventing IUU fishing activities, implementation of conservation measures presented by the international fisheries bodies, and registration and management of fisheries business.

Regional Aquatic Animal Health Programmes

SEAFDEC AQD (Dr Joselito Somga)

Southeast Asian Fisheries Development Center-Aquaculture Department (SEAFDEC-AQD) is located at the Tigbauan Mian Station on the south coast of Panay Island, Philippines, where brackishwater pond aquaculture has historically been a big industry. The staff of the Fish Health Section of SEAFDEC-AQD are positioned by approval of SEAFDEC Programme Committee. In addition, four technical assistants are hired on fixed-term basis under projects funded externally by the Government of Japan Trust Fund (GOJ-TF) and the Japan International Research Center for Agricultural Sciences (JIRCAS). All scientists in the section are active researchers with at least two approved studies per year.

Ongoing research includes: 1) carriers for practical delivery of vaccines to shrimp and other crustaceans; 2) the host response of *Lates calcarifer* to *Amyloodinium ocellatum*; and 3) epidemiological approach to establish a management technology for disease tolerant and sustainable aquaculture environment; 4) parasitic and shell diseases of abalone (*Haliotis asinina*) in the Philippines; 5) the molecular diagnosis and prevention of economically important viruses in fish and shrimp; 6) screening for antimicrobial activities of crude extracts from Philippine red seaweeds; and 7) immunisation regimen for the prevention of viral nervous necrosis (VNN) in high value marine broodfish.

The SEAFDEC-AQD Fish Health Laboratory is committed to comply with OIE aquatic animal health standards. The Laboratory has participated and passed the ring test for diagnosis of shrimp pathogens conducted by the OIE Reference Laboratory at the University of Arizona. It is also a participant in the ongoing Asia Regional Diagnostic Laboratory Proficiency Testing being facilitated by the NACA. The facilities are available for bacteriology, virology, cell culture, molecular microbiology (PCR), wet laboratory, infection building, microtechnique laboratory and Laboratory for Advanced Aquaculture Technology (LFAAT).

For the response to the challenge of emerging and unknown pathogens in Philippines, surveillance of Tilapia and mudcrab pathogens have been conducted. The diagnostic tools has also been developed through genomics and establishment of the Philippines Shrimp Pathogen Bio-Bank and Online Biosurveillance Information Resource, in collaboration with the Philippine Genome Center. SEAFEDC-AQD also provides the on-site training on Freshwater Fish Health Management in Myanmar and Cambodia, and is participating in regional AAH Management activities.

SAARC (Mr P.K. Kolaventy)

The content of this presentation was not relevant to the objectives of the workshop. Accordingly the summary is not provided in this summary report.

Case Study on Emergency Aquatic Animal Disease Response

Note: The participants were provided with three presentations for the case studies of molluscs and ascidian diseases, crustacean diseases, and finfish diseases to provide the supportive information for the group discussions on EAAD Responses.

Molluscs & Ascidian disease (Prof Tomoyoshi Yoshinaga)

Two case studies are provided; Akoya oyster disease and the soft tunic syndrome (of sea squirt).

Akoya oyster disease is the disease affects to the Japanese pearl oyster (*Pinctada fucata martensii*) by unknown infectious agent which is filterable at 0.45 µm filter. The affected oyster shows red-brown adductor muscle in microscopy, with histopathological lesions of degenerated loose connective tissue in the mantle and infiltration of hemocytes in the mantle connective tissue. The disease progress at high temperature (>20° C) especially in late summer and autumn in natural conditions. The progress is subchronic since 2-3 months were needed for significant mortalities in challenge experiments. Mortality rate can be up to 80% in one-year-old oysters and lower mortality rates can be found in older oysters.

In 1994-1995, high mortalities up to 70% characterised with red-brown adductor muscle occurred in some local areas in Ehime Prefecture and Oita Prefecture. Nothing could be done to control the disease since it was novel and little information was available. The disease was epidemic in most akoya oyster farms by 1996. Many theories appeared on the etiology of the disease including pollution with formalin or low phytoplankton density in the sea. National Research Institute of Aquaculture (NRIA), MAFF Japan organised a research unit and meetings in response to the mortalities, and the emergency meetings were organised with officers of local and central governments, university researchers, and pearl industry associations. In January 1998, NRIA proved that the disease was infectious by implantation of the mantle piece of affected oysters to naïve oysters and by cohabitation of naïve oysters with affected oysters. Despite the continuous effort of government and concerned personnel, the pathogen is not known yet and the confirmatory and rapid diagnoses of the disease are still difficult to date, having severe effect on annual production of akoya pearls in Japan.

The epidemiological studies suggested that the pathogen came from China, and the farmers are suggested to raise akoya oysters in low-temperature areas with deep immersion (5-10 meter), and to use cross-bred akoya oysters between Japanese oysters and Chinese oysters (one geographical type of *Pinctada fucata* which is tolerant to the disease) for pearl production.

The soft tunic syndrome is the infection of flagellate *Azumibodo hoyamushi* to sea squirts (2-3 year-old individuals of *Halocynthia roretzi*, *Styela clava* and possible some other sea squirts). The infection can be diagnosed by microscopy or PCR, whereas the lesions are limited to the tunic; i.e., coarse fibrous tissue and partially destroyed tunic and/or flagellates in lesions in the tunic can be found. The disease usually appears during December and August and progresses in low temperature (<20° C). The mortality rate can be ranged between 35-95 % in three-year-old sea squirts and 20-30% in two-year-old sea squirts.

The syndrome was firstly reported in Korea in 1995. Etiology was still unclear when the disease was found firstly in Japan in 2007. In fact, an inquiry commission from Japan was sent to Korea in 2004 and reported the presence of the disease publicly. However, Korean sea squirt seedlings were introduced into the northern area in Miyagi in the same year. Most of the introduced seedlings died soon but there were some survivors left in farms. Local Government announced warnings on the disease of sea squirt in 2005 and 2006 with non-mandatory request for self-refrainment of the introduction of foreign sea squirt seedling. In autumn 2006, mass mortality occurred in the survivors of sea squirt introduced from Korea in 2004. However, the introduction of seedlings was not stopped. In January 2007, diseased sea squirts appeared for the first time in Japan. Seventeen months later, infectivity of the disease was proven by challenge experiments. In April 2010 (39 months later after the first occurrence), the pathogen (parasitic flagellate) was specified by challenge experiments using flagellates isolated from affected sea squirts and cultured in a cell-culture medium. The disease was also established at very low levels in wild populations of sea squirts in Japan.

The sea squirt culture was prosperous. The farmers had low awareness and concern on epidemics and imported the seedlings. The communication between farmers and government was low, and all requests from local government and central government were not mandatory. Those factors can be considered as the facilitators for the spread of soft tunic syndrome in sea squirts.

Characteristics of epidemics in molluscs are: 1) non-containable and non-eradicable because of the presence of wild population and open culture environment; 2) non-predictable because of high diversity in host species and host switch; and 3) non-treatable.

Based on the lessons learnt from two case studies in molluscs, emphasis should be on prevention of invasion of exotic diseases, rather than taking action on containment, eradication and application of treatment/vaccination after invasion. Measures should be taken based on 'scientific justifications and risk assessment' and 'temporary precautionary measures'. The SPS measures must be applied whenever imports of live seedlings for aquaculture and live animals for food has to be done.

Crustacean disease: AHPNS (Ms Jaree Polchana)

Early Mortality Syndrome (EMS) has been reported to cause significant losses of shrimps (*Penaeus monodon* and *P. vannamei*) in China (2009), Vietnam (2010), Malaysia (2001) and Thailand (2012). Gross signs of EMS include significant atrophy and pale or yellow or white discoloration of hepatopancreas (HP). Sometimes black spots or streaks are visible in HP. The shell of affected shrimp becomes soft or loose, and no content or discontinuous content can be found in the gut. The shrimps can be lethargy or jump, then sink to the bottom or shows corkscrew swimming. Mass mortality (50-100%) of shrimp occurs in 10-35 days after stocking in grow-out pond.

Histopathological studies on shrimp HP demonstrate that medial to distal HP shows acute progressive degeneration with dysfunction of B, F, R and E cells, enlarged nuclei with prominent nucleoli, sloughing of HP tubule epithelial cells, and intertubular hemolytic congestion. The

secondary bacterial infection can be found at the terminal stage of the disease. Later the disease was renamed as Acute Hepatopancreatic Necrosis Syndrome (AHPNS).

The causative agent of AHPNS has been identified as *Vibrio parahaemolyticus* (Tran et al., 2013), which is unique strain that infected with a phage. The challenge studies with *V. parahaemolyticus* demonstrated the 100% mortality of shrimp with typical EMS/AHPNS pathology and identical histopathological lesions to those found in EMS/AHPNS infected shrimp in endemic areas.

Since the initial report of EMS/AHPNS in Thailand in January 2012, total of 11 provinces has been reported the cases, and annual production of shrimp in 2013 (Jan-Sep) decreased to 53% compared with that of previous year. The decreasing of Shrimp production may influenced by the reduction of PL stocking as a consequence of the insufficiency of PL quantity and shrimp farmers were unconfident due to the EMS situation. Diseases and management system were also possible to cause shrimp production decreasing, however, the information from EMS/AHPNS passive surveillance program showed only 3.55 % of cases in the first quarter and 1.83 % in the second quarter of 2013 were positive for AHPNS (confirmed by histopathology described in NACA website).

To mitigate the impact of EMS/ AHPNS, the Department of Fisheries (DoF) has not only been focusing on control of *V. parahaemolyticus*, but also emphasizing on sanitary management in all steps of shrimp production including in hatcheries, nurseries and grow-out facilities in order to diminish the risks of production losses. DoF conducts the following actions:

1. Setting up the local and central EMS/AHPNS war rooms;
2. Surveillance and monitoring programme;
3. Mitigation and management measures to lessen the EMS/AHPNS Risk, which is the collaboration between the government and private sectors, was initiated in early 2013;
 - 3.1. Improvement of hatchery sanitation
 - 3.2. Improvement of nursery sanitation and management
 - 3.3. Improvement of shrimp farm management
4. Measures for management and control of EMS/AHPNS outbreak in shrimp farm;
5. Increase flexibility of the importation of Pacific white shrimp broodstock;
6. Ongoing research and study epidemiology, causative factors and solution approaches of EMS in marine shrimp in Thailand;
7. Communication and public awareness.

As the result, shrimp production have a tendency to be increased in July-September 2013, that may attribute to increasing of PL stocking which started in late March due to the farmers have confident in the resolution of DoF and the importation of quality broodstock, and improvement of farm management, and the occurrence of disease is likely to be decreased.

Finfish Diseases: KHV (Dr Kei Yuasa)

Koi herpesvirus (KHV) disease caused by cyprinid herpesvirus 3 (CyHV-3, commonly known as KHV) is and emerging disease causing mass mortality in koi and common carp, *Cyprinus carpio* worldwide. The disease has been reported in more than 30 counties. In Asia, mass mortality due to KHV was first reported in Indonesia in 2002, but the source of KHV was suspected to

be koi imported from Hong Kong. Recently KHV was detected in common carp samples preserved from 1998 in Korea. KHV was detected in total 8 countries in Asia; Malaysia, Taiwan, Japan, Thailand and Singapore as well as Korea, Hong Kong and Indonesia.

In Japan, mass mortality due to KHV was first observed in cultured common carp at Kasumigaura Lake in October 2003. The Lake had produced over half of Japan's total production and distributed live fish to most of prefectures in Japan. After the case of mortality was diagnosed as KHV disease by National Research Institute of Aquaculture (NRIA; a central laboratory of aquatic animal health), the movement of carp was restricted by Japanese law and all surviving fish were disposed. Unfortunately, infected fish had already been transferred to aquaculture farms, wholesalers, restaurants and game fishing facilities throughout Japan. In fact, another prefecture had been contaminated with KHV in May 2003 when KHV was not listed by both Japanese government and the OIE. Therefore, the prefectural experimental station could not diagnose the case due to a lack of information on KHV, resulting in a virus transmitting to Kasumigaura Lake. This event is teaching us the importance of distributing disease information by the OIE and transferring the information to local government/ experimental station as well as to farmers by the central government. With a precept by the event, the NRIA holds training courses on diagnosis for prefectural station staff every year.

Since KHV disease was listed by the World Organisation for Animal Health (OIE) in 2006, the NRIA has been designated as a Reference Laboratory (RL) of the disease. The OIE mentions that expert of the RL should be a leading and active researcher helping the RL to provide scientific/technical assistance and advice on surveillance and control of the disease. From this point of view, we have been continuously studying on KHV disease for preparing more reliable diagnostic methods.

At present, we are faced with two issues on KHV diagnostic tests; susceptible host species to KHV and development of intra vitam assay for koi carp. In the former issue, the OIE started to discuss that goldfish should be included in the category of susceptible host species based on some reports by Germany researchers. However, onset of KHV disease was never reported in goldfish and there was no data suggesting a potential risk of goldfish for KHV transmission in Japan. Then, we verified whether goldfish is susceptible to KHV or not by detecting KHV replication stage in goldfish after exposing to KHV using mRNA specific RT-PCR. Further, KHV-exposed goldfish were cohabited with wild-type carp which is much higher sensitive to KHV than common carp or koi carp, and the wild-type carp were examined for KHV detection. Results indicate that no goldfish can neither be infected by KHV nor transmit KHV as virus carrier.

In the latter issue, cohabitation assay, in which koi carp for exportation are cohabited with naïve carp and the recipient were examined for PCR, had been adopted as a diagnostic test for exporting koi carp in Japan until KHV disease was listed in 2006. Since then, the government has been guiding a direct examination by PCR from koi carp in population for exportation, due to absence of cohabitation assay in the OIE Manual. Although, the cohabitation is useful method for expensive koi carp as intra vitam assay. Then, we attempted to prove the detection efficiency of cohabitation assay in an experimental infection test. In the test, koi carp exposed with a low titer of KHV, which did not show any clinical sign and mortality during the test, were cohabited with naïve carp at 1 day after the viral exposure and kept cohabitation for 3 weeks. In the test,

the amount of viral genome in recipient carp was higher than that in carp originally exposed to KHV, which suggest that PCR can detect KHV easier from recipient rather than from the originally infected fish. Therefore, cohabitation assay may be the best method to detect the fish shedding the virus. However, a disadvantage of the assay is low ability to detect the fish survived the infection. The future study should be focused on whether the survivor can become a carrier of the virus or not.

General Discussion

Following each presentation of case studies, i.e., molluscs and ascidian diseases, shrimp diseases, and finfish diseases, participants were divided into three groups to discuss the status of EAAD Response in the region. Grouping was maintained for three discussions and participants were provided with inquiry sheets to initiate their discussion (Annex II & III). The below is the summary of group reports for each topic.

- A. **Molluscan diseases:** In general there is not much capacity for EAAD response in the region (in terms of diagnostics and expertise), as molluscan culture activities are somehow limited compared to crustaceans and finfish. Nevertheless, the group still considered disease outbreaks among cultured molluscan species as threat, which might result to significant economic losses, just like the cases of Akoya oyster disease and Soft tunic syndrome in Japan. Despite several molluscan aquaculture activities in the region (e.g. oysters, mussels, abalone and clams), only few countries have the required capacity and expertise for diagnosis of molluscan diseases. The following recommendations were formulated by the group:
1. Due to the lack of prioritization for molluscan disease diagnostics and surveillance from the government side, international intervention (in terms of technical assistance and financial support) is necessary in order to develop capacity on field level diagnosis and laboratory tests.
 2. Considering the open-culture system for most of these molluscan species, biosecurity, prevention and control measures are practically difficult to implement/apply. Thus, proper quarantine and preventive measures should be applied prior to open-system aquaculture operation;
 3. Strict quarantine procedures should be implemented when movement of live animals is involved. This is to prevent entry of exotic diseases that may affect the local stocks.
- B. **Shrimp diseases (AHPNS):** All countries have diagnostic capacities for shrimp diseases in general. However, some countries still need capacity building programs/training on diagnostics of emerging shrimp diseases like AHPNS. This is important in formulating EAAD response in cases of outbreaks of important trans-boundary and emerging diseases. The following activities were recommended in undertaking emergency response in countries affected and not-affected by the disease:
1. Awareness program. This is highly important to properly inform different stakeholders on the nature and effect of the disease. For countries affected by the disease, intense information campaign should be made especially at farmers' level, through appropriate media that can efficiently convey the necessary information regarding the disease. Media can include posters, radio programs, simple disease brochures or disease card in local language, etc. For countries not yet affected by the disease, information should be properly disseminated to proper authorities who have direct contact with the different stakeholders, including local farmers if possible.

2. National surveillance and mandatory reporting. This should be initiated by the government (either as official regulation or simple project activity) through proper authorities (Ministries/Departments), and encourage farmers (commercial and small-scale) to report suspected cases of AHPNS (based on the information disseminated to them). Active (rather than passive) surveillance should also be done on selected sites with confirmed cases of AHPNS (for countries affected), and among important shrimp production areas (countries not yet affected).
3. Composition of Task Force or Emergency Team. The task force/team will properly assess the situation of the disease in terms of surveillance, diagnosis, spread, prevention and control, for countries which are already affected by the disease (China, Thailand and Vietnam). For other countries not affected by the disease, the task force/team should facilitate information dissemination, contingency planning and emergency guidelines in case of outbreaks, development of diagnostic capacities, active surveillance on selected sites, and plan for appropriate prevention and control measures.
4. Legislations for control of AHPNS. This is the responsibility of the task force/team as a result of their assessment of the disease situation (countries affected) and contingency planning (countries not yet affected). These legislations should be implemented immediately for effective management, prevention and control of the disease. Legislations/regulations and health certification on movement (within country and cross-border) of live shrimps (all stages) should be properly and strictly implemented.
5. Training program at national level for different stakeholders. Common problem in most countries is the lack of manpower and resources to effectively implement aquatic animal health management strategies at national level, especially in the case of AHPNS outbreaks. Thus, capacity building in terms of diagnostics and expertise are needed for most of the countries in the region.
6. Application of standard guidelines in terms movement of live shrimps (e.g. IRA) and culture management practices (e.g. BMPs, GAPs). Presently, IRA is not fully implemented or operational in most countries in the region. In some cases, regulations for within-country movement of live shrimps are not fully implemented. For AHPNS, one of the recommendations in the recently concluded FAO TCP (Vietnam) on prevention and management of the disease in the region is to apply GAPs from broodstock to grow-out production of cultured shrimps. Although countries affected by the disease have been trying different measures to prevent/control the disease, scientific evidences are still needed before such measures can be recommended.

C. **Koi herpes virus.** The discussion is focused on the current diagnostic procedure, quarantine measures, prevention and control and susceptibility of other species. Below is the summary of the group response:

1. Diagnostic methods:

- a. PCR method is still useful but results are variable depending on the primers used;
- b. Alternatively, real time/quantitative PCR can be used as this is more sensitive, however expensive. Immunohistochemistry is also recommended as it provides consistent results;
- c. Co-habitation is promising or even useful for certifying KHV-free, especially for quarantine of expensive ornamental Kois;
- d. ELISA is also useful especially for antibody detection to provide historical information on the exposure of fish to the virus.

2. Prevention from Spreading

- a. Disposal (killing, incineration) and disinfection of facilities (both for cross-border and in-country movement);
- b. Declaration of affected area for quarantine; however, this is not possible for open-system aquaculture;
- c. Regulating fish movement in some countries is not effectively implemented due to some issues with local farmers/businessmen (e.g. social issues, compensation scheme); this will result to high risk of introducing a new strain of KHV;
- d. Stoppage of culture operation for 2 years once the cultured carps are affected by KHV (Indonesia);
- e. Vaccination: attenuated vaccine can be used for disease prevention; but procedure is not recommended if fish are intended for export.

3. Prevention from importing pathogens

- a. Quarantine system either at importer's premises (approved by the government) or quarantine facilities of the country; should highly consider the appropriate containment period for quarantine, especially for highly priced Kois;
- b. Health certificate inspection;
- c. Problem: Difficulty in the implementation of movement control due to many entry points in some countries.

4. Host susceptibility

- a. Mixed opinion on goldfish being carrier of KHV; presently there is no scientific evidence to support this theory, although koi and goldfish belong to the same carp family;
- b. Best examination to evaluate host susceptibility is combination of molecular, serological and co-habitation methods.

OIE Regional Workshop on Emergency Aquatic Animal Disease Response in collaboration with NACA Bali, Indonesia, 6-8 November 2013		
6 November 2013 (Wed)		
Time	Theme	Speaker
08:30 – 09:00	Registration of participants	
09:00 – 09:30	Inauguration and opening <ul style="list-style-type: none"> • Host country • OIE Regional Representative for Asia and the Pacific • Network of Aquaculture Centres in Asia-Pacific 	Dr Pudjiatmoko Dr Hirofumi Kugita Dr Eduardo Leano
09:30 – 09:40	Photo Session	
09:40 – 10:40	<ul style="list-style-type: none"> – OIE Aquatic Animal Health Code and Manual of Diagnostic Tests for Aquatic Animals – FAO-NACA Technical Guidelines on Responsible Movement of Live Aquatic Animals 	Dr Hnin Thidar Myint Dr Eduardo Leano
10:40 – 11:00	Morning Break	
11:00 – 12:00	<ul style="list-style-type: none"> – QAAD Reporting – Current Disease Trends in Aquaculture (global/regional) – Q & A 	Ms Nanae Takagishi Dr Eduardo Leano
12:00 – 13:00	Lunch Break	
13:00 – 14:00	Country presentations <ul style="list-style-type: none"> – Bangladesh – India – Indonesia – Q & A 	Dr Malay Sanker Dey Dr I.A. Siddiqui Mr Maskur Maskur
14:00 – 14:30	Case Study on EAAD Response (Molluscs & Ascidian disease)	Dr Tomoyoshi Yoshinaga
14:30 – 16:00	Small Group Discussion on EAAD Response on Molluscs diseases	
16:00 – 16:20	Afternoon Break	
16:20 - 16:40	Group Discussion reports Q & A	
16:40 – 17:40	Country presentations <ul style="list-style-type: none"> – Myanmar – Sir Lanka – Vietnam – Q & A 	Dr Zaw Win Dr G.R. Arachchige Dr Le Van Khoa
19:00 – 21:00	Welcome dinner hosted by Directorate General of Aquaculture, Indonesia	

ANNEX I: Programme

7 November 2013 (Thu)		
09:00 – 09:15	Recap of Day 1	
09:15 – 10:30	National Aquatic Animal Health Programmes – China – Japan – Korea Q & A	Dr Dongyue Feng Dr Keiko Okamoto Dr Mi Young Cho
10:30 – 10:45	Morning Break	
10:45– 11:15	Case Study on EAAD Response (Crustaceans: AHPNS)	Ms Jaree Polchana (Thailand)
11:15 – 12:30	Small Group Discussion on EAAD Response on AHPNS	
12:30 – 13:30	Lunch Break	
13:30 – 13:50	Group Discussion reports Q & A	
13:50 – 14:30	Regional Aquatic Animal Health Programmes – SEAFDEC AQD – SAARC Q & A	Dr Joselito Somga Dr P.K. Kolaventy
14:30 – 15:00	Case Study on EAAD Response (Finfish disease: KHV)	Dr Kei Yuasa (OIE RL)
15:00 – 16:15	Small group discussion on EAAD Response on Finfish diseases	
16:15 – 16:30	Afternoon Break	
16:30 – 16:50	Group Discussion reports Q & A	
16:50 – 17:50	Recommendations/ The way forward	
17:50 – 18:00	Closing	
18:00 – 20:00	OIE Reception	
8 November 2013 (Fri)		
07:00 – 18:00	Field Trip to Finfish Farm in Gondol, Buleleng District, Bali, Indonesia	
End of the Workshop		

ANNEX II: Inquiry Sheet for Group Discussion I (Molluscs)

Sheet #1: How can your government contain and eradicate important molluscan infectious diseases, when they appear in your country?

	Molluscs cultured on Plankton (eg. Oysters)	Molluscs cultured on large scale (eg. Abalones)	Wild commercial molluscs	Other type of Mollusk if you have	Other type of mollusk if you have
Name of important molluscs in your country					
Containment					
Eradication					

Types of SPS Measures

- The SPS Agreement encourages governments to establish national SPS measures consistent with international standards, guidelines and recommendations.
- Members may use measures which result in higher standards if there is scientific justification. They can also set higher standards based on appropriate assessment of risks so long as the approach is consistent, not arbitrary.
- They can to some extent apply the “precautionary principle”, a kind of “safety first” approach to deal with scientific uncertainty. Article 5.7 of the SPS Agreement allows temporary “precautionary” measures.

The sentences above are extracted from ‘Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, May 1998’

- We have three type of SPS measures:
- Measures following international standards, guidelines and recommendation (IS)
- Higher measures based on scientific justification and risk assessment (SR)
- Temporary precautionary measures (TP)

ANNEX II: Inquiry Sheet for Group Discussion I (Molluscs)

Sheet #2: Please suppose that a highly pathogenic disease occurred in neighboring countries or zones.

Which type of measures can your government apply according to current domestic laws and rules?

Which type of measures do you think is effective for prevention of the invasion of the epidemic?

Your name.....

Country.....

	Government	Personal opinion
OIE Listed disease		
Disease Listed by NACA only		
Well-studied epidemics with a known pathogen (not listed)		
Seemingly infectious disease with an unknown pathogen		
Possible infectious disease (infectivity not confirmed)		

We have three type of SPS measures:

- Measures following international standards, guidelines and recommendation (IS)
- Higher measures based on scientific justification and risk assessment (SR)
- Temporary precautionary measures (TP)

ANNEX II: Inquiry Sheet for Group Discussion I (Molluscs)

Sheet #3:

Country.....

Give us information on the importance of molluscs industry in your country.

Production for exportation/production for domestic consumption

Aquaculture/capturing fisheries

Important species

Give us information on the importation of molluscs in your country

Species.

Live/fresh/frozen

Are Mollusk diseases involved in your national strategy for aquatic animal disease control?

Pathogen

Host species

Import risk/domestic transportation

Sheet # 4

Q-1. Describe successful cases, if you know, in which important infectious diseases of molluscs or aquatic invertebrates other than crustaceans were contained and/or eradicated in Asian-Pacific countries.

Q-2. Describe cases in which important infectious diseases of molluscs or aquatic invertebrates other than crustaceans invaded and spread in Asian-Pacific countries.

Q-3: what kinds of scientific information and measures/methods do you think are necessary for containment and eradication of infectious diseases of molluscs?

Q-4: Please suppose that a highly pathogenic disease but unlisted in OIE occurred in your countries or zones. What kinds of scientific information do you think are necessary to determine control measures for prevention of the invasion of the disease?

Q-5: Is it possible for your government to issue mandatory orders and requests to aquaculture farms? If yes, what is the condition and requirement for the issue of the mandatory order?

You can set up your own questions in your discussion team according to your concerns and situations surrounding you, and try to find answers to the questions.

Q-6: How can you prevent invasions exotic molluscs diseases that have not invaded your country and have not been studied well?

1. Diagnostic method

- 1) Is there any problem of present PCR methods? (about sensitivity and specificity)
- 2) Which diagnostic methods except for PCR do you recommend for KHVD?
- 3) What do you think of 'cohabitation' as an examination for certifying KHV-free?
- 4) Do you think that ELISA is necessary for KHV diagnosis? And Why?

2. Prevention from spreading

- 1) What did your country perform to contain or eradicate the pathogen when KHVD has occurred?
- 2) How did the performance come out (can eradicate or zoned or spread?)
- 3) What is a problem of present system to prevent from spreading?
- 4) What do you think of using attenuated vaccine for aquatic animal?

3. Prevention from importing pathogen

- 1) How does your country quarantine live fish for importation?
- 2) Why did KHV enter to your country, even you established quarantine system?

4. Evaluation of host susceptibility to pathogen (in viral case)

- 1) Do you suspect goldfish of being carrier of KHV?
- 2) Why do you suspect or not suspect?
- 3) Do you think which examination is the best to evaluate host susceptibility to pathogen?





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