



Food and Agriculture Organization
of the United Nations

Round-Table Discussion: Moving Forward through Lessons Learned on Response Actions to Aquatic Disease Emergencies



16 -18 December
German room, C269
(Building C, 2nd floor)








Background

- **Chronology of pathogen/disease emergence**
- **Factors, drivers and pathways to aquatic animal disease emergence in aquaculture**
- **Aquatic Animal Disease Emergence Causal Web**
- **Progressive Management Pathway to Improve Aquaculture Biosecurity (PMP/AB)**
- **National Strategy on Aquatic Animal Health (NSAAH)**
- **One of five pillars of the planned Aquaculture Biosecurity Partnership Programme**



Pathogen/Disease Emergence in Aquaculture



Parasites
Bacteria
Virus Fungi

ISA (salmon) 
 IPNV (tilapia) 
 Sea lice (salmon) 
 WSSV, HPV, IHNV,
 BP (shrimp) 
 NHP (shrimp) 

These pathogens affect all phases of production (hatchery, nursery, grow-out).

MoV, IMNV, CMNV, LSNV (shrimp) 
 AHPND (shrimp) 
 TiLV (tilapia) 
 VNN (tilapia and marine finfish) 
 EHP *Enterocytozoon hepatopenaei* (shrimp)

1970s



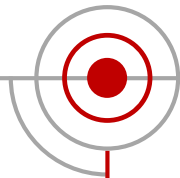
Gyrodactylus (salmon) 
 MBV (shrimp) 
 LCDV (tilapia) 
 EUS (many finfish)

1980s

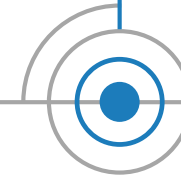


YHV, TSV (shrimp)
 Vibriosis: *Vibrio* (*harveyi*, *damsela*, *alginolyticus*, *vulnificus*, *penaeicida*) (shrimp) 
 KHV (carps/koi carp)

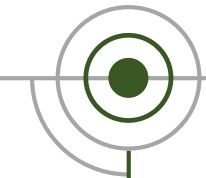
1990s



2000s



Future

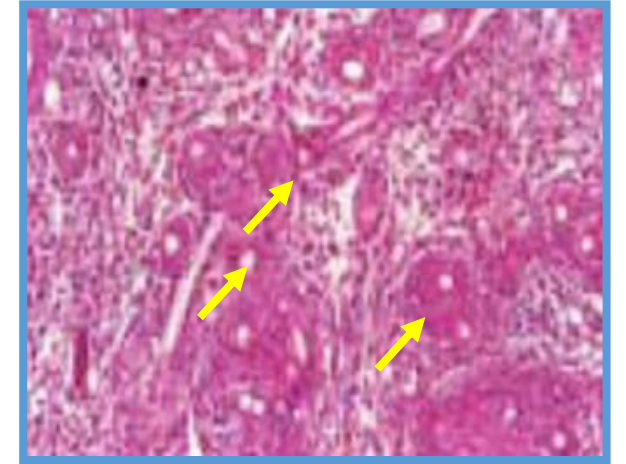


We expect more diseases (exotic, endemic, emerging) if no biosecurity actions are taken

Diseases in Aquaculture



EUS: fungi/many finfish species



1970s



Disease (observation in the field)

1980s



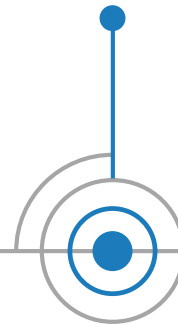
Diagnosis

1995



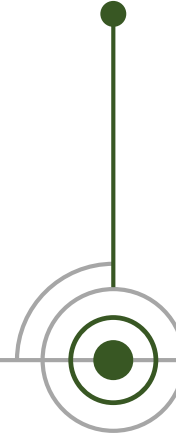
Adopted in OIE AAH Code

?



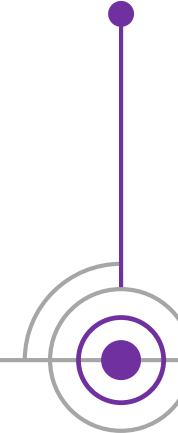
Containment (vaccine, treatment, husbandry)

?



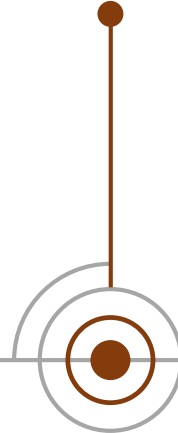
Management (cost effective)

?



Disease Freedom

?



National and international confidence to the sector



Photo credit: Dr D Lightner

Diseases in Aquaculture



WSSV: virus/shrimp

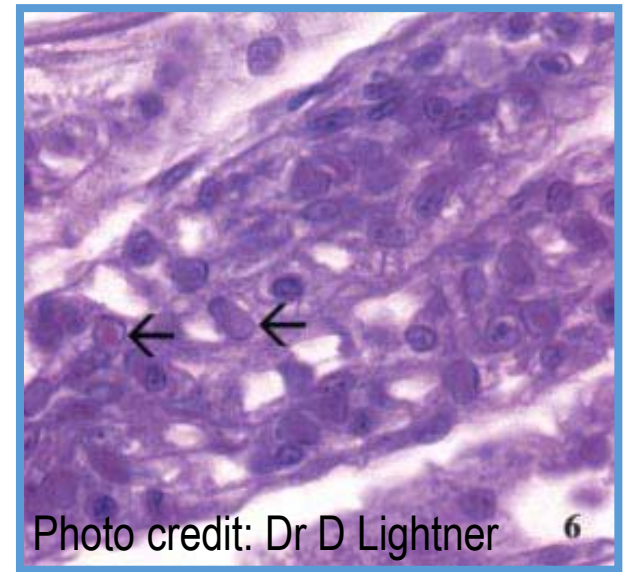
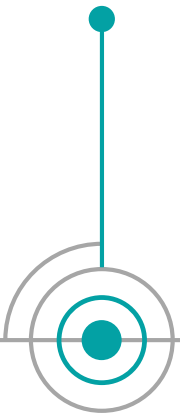


Photo credit: Dr D Lightner 6

1980s



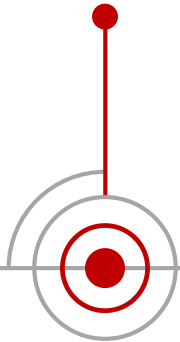
Disease (observation in the field)

Mid-1990s



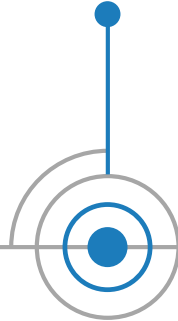
Diagnosis

1997



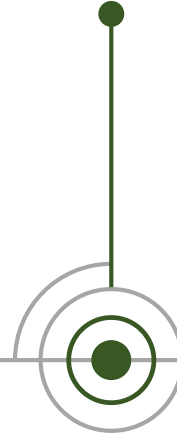
Adopted in OIE AAH Code

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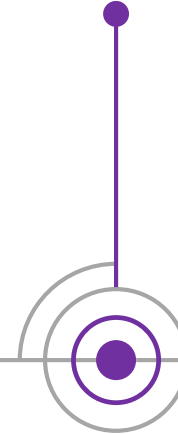
Containment (vaccine, treatment, husbandry)

?



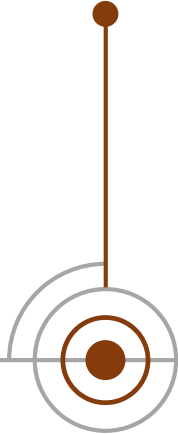
Management (cost effective)

?



Disease Freedom

?



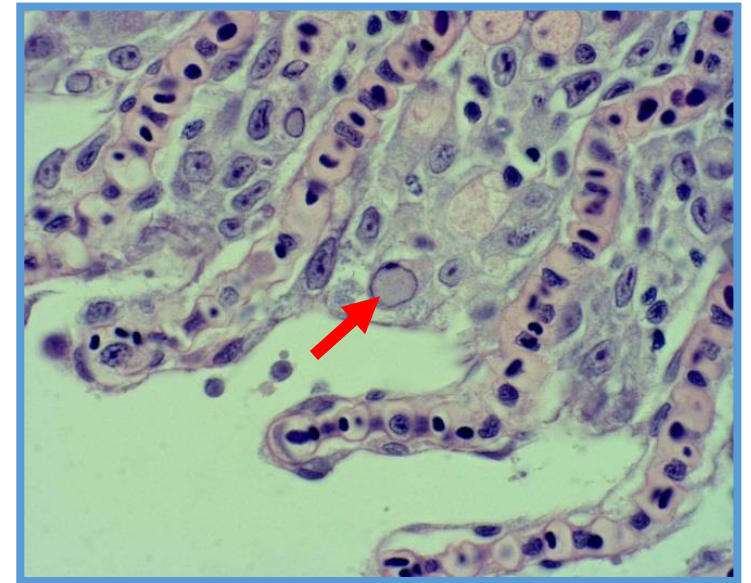
National and international confidence to the sector



Diseases in Aquaculture



KHV: virus/carp & koi carp



1990s



Disease (observation in the field)

Mid 2000s



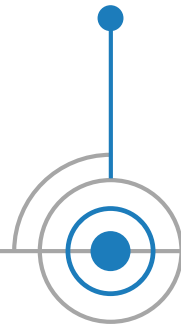
Diagnosis

2007



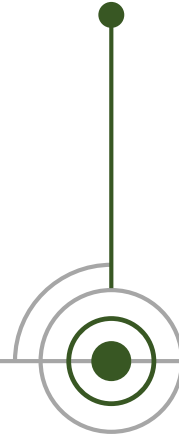
Adopted in OIE AAH Code

2018//2019



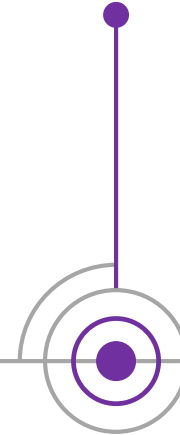
Containment (vaccine, treatment, husbandry)

?



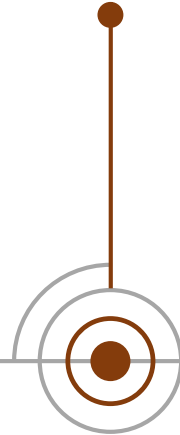
Management (cost effective)

?



Disease Freedom

?



National and international confidence to the sector

Diseases in Aquaculture



AHPND: bacteria/shrimp

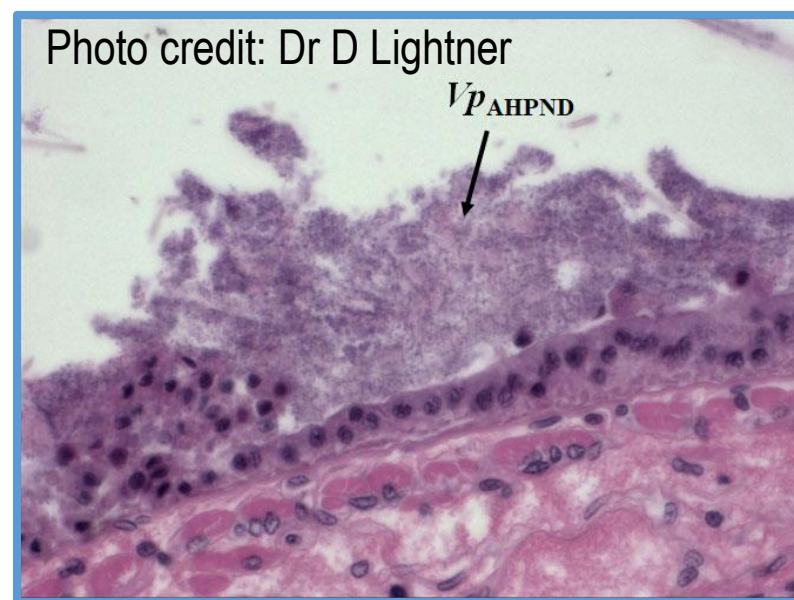


Photo credit: Dr D Lightner

Vp_{AHPND}



AHPND

Healthy

Empty stomach

Full stomach

Pale, atrophied HP

Brownish HP

Empty gut

Full gut

Photo credit: Dr D Lightner

2009

2013

2017

?

?

?

?

Disease
(observation
in the field)

Diagnosis

Adopted in OIE
AAH Code

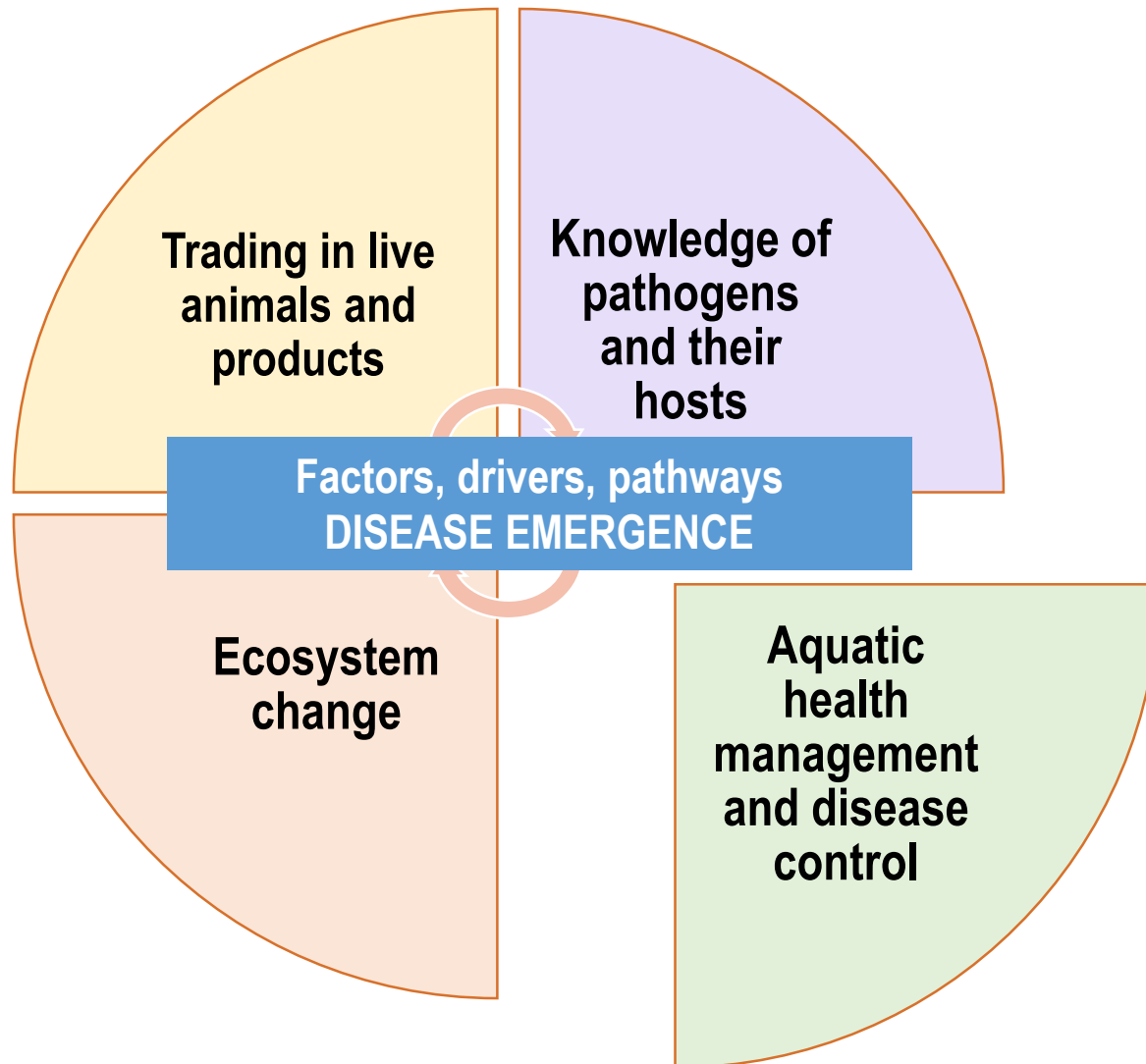
Containment
(vaccine,
treatment,
husbandry)

Management
(cost effective)

Disease
Freedom

National and
international
confidence to the
sector

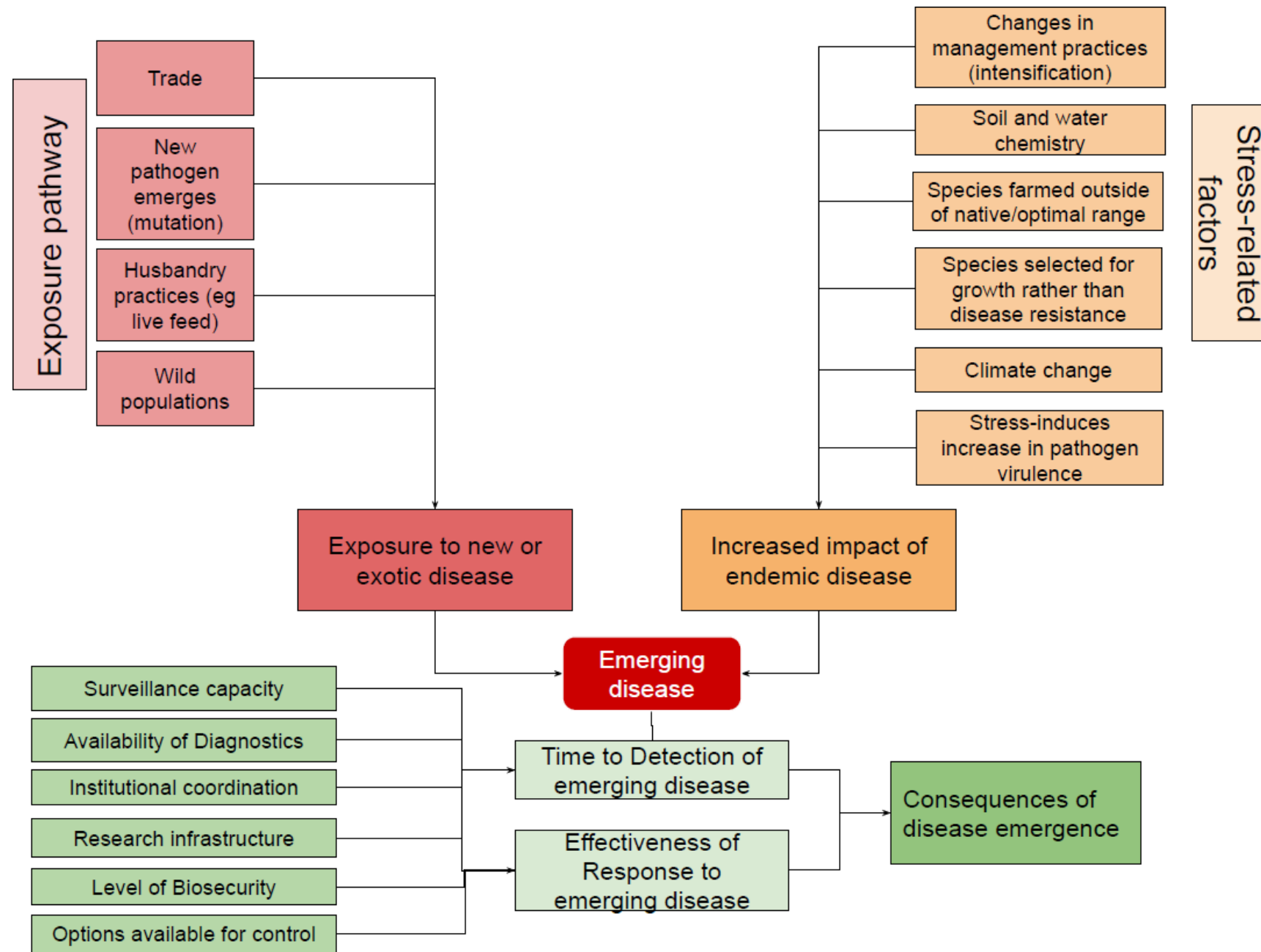
Factors, drivers and pathways to aquatic animal disease emergence in aquaculture



- Multiple institutions involved in AHM. The Competent Authority?
- Inadequate or poorly implemented biosecurity measures/**low capacity for emergencies**
- Inconsistent or weak implementation of international standards etc
- Perceived low incentive to report on known and emergent diseases (trade)
- Weak regulatory framework and public-private sector partnership working
- Mismatch between research agenda and farmer/commodity sector needs
- Few national pathogen/host inventories

Aquatic Animal Disease Emergence Causal Web

- Emerging disease explained through:
 - exposure pathways to new or **exotic disease**
 - stress-related factors increasing impact of **endemic disease**
- Aspects affecting **detection** and **effective response**



**Biosecurity
strategy
(risk)
defined**

Stage 1

Basic capacity on
emergency
management

Rapid detection
and response

Stage 2

**Biosecurity
systems
implemented**

**Enhanced
biosecurity and
preparedness**

Stage 3

Efficient and
effective
outbreak
management

Stage 4

**Sustainable
biosecurity
and health
management
systems
established to
support national
aquaculture
sector**

PMP/AB 4 stages: risk-based, collaborative, progressive

**Each stage has key considerations and key
outcomes**

National Strategy on Aquatic Animal Health within the PMP/AB



Five Major Pillars: Aquaculture Biosecurity Partnership Programme: endorsed by COFI/SCA 10th session

- **Pillar 1:** Strengthening **disease prevention at farm level** through responsible fish farming (including **reducing AMR in aquaculture** and the application of suitable alternatives to antimicrobials) and other science-based and technology-proven measures;
- **Pillar 2:** Improving **aquaculture biosecurity governance** through implementing **PMP/AB**, enhancing interpretation and implementation of **international standards** and strengthening the **One Health** approach by bringing together stakeholders to design and implement mandated biosecurity measures;
- **Pillar 3:** Expanding understanding of **aquaculture health economics** (burdens and investments, opportunity cost);
- **Pillar 4:** Enhancing **emergency preparedness** (e.g. early warning and forecasting tools, early detection, early response) at all levels; and
- **Pillar 5:** Actively supporting pillars 1-4 with several **cross-cutting issues** (e.g., capacity development, disease intelligence and risk communication, education and extension, targeted research and development and innovation).

4 Ps:

Purpose, Participation,
Process, Products

Purpose

- Take stock, share experiences and lessons learned on response actions to aquatic animal disease emergencies
- Review and make recommendations for development and improvement of the draft FAO *Decision-tree for dealing with aquatic animal mortality events*
- Make recommendations towards the development of a framework for a systematic assessment of the financial, socio-economic and other impacts of aquatic animal diseases
- Identify key elements for a project proposal to improve national response actions to aquatic animal disease emergencies

Participation

- Some 43 representatives of national government agencies, international and regional organizations, non-governmental agencies, aquaculture producers and academia are participating in this event
- China, Ghana, Indonesia, Kingdom of Saudi Arabia, Norway, Philippines, Thailand, Vietnam, USA, Zambia
- NACA, OIE, FAO
- MSD (Belgium), IZSV (Italy), WVR (Netherlands), CEFAS (UK), MSU (USA)
- SFP, Canada, Croatia, Italy, Mozambique, South Africa, U.K.

Process

- **Session 1:** Response actions to aquatic animal disease emergencies
- **Session 2:** Decision-tree for dealing with aquatic animal mortality events
- **Session 3:** Framework for systematic impact assessment of aquatic animal diseases
- **Session 4:** Key elements for improving response actions to aquatic animal disease emergencies

Agenda

Day 1	Day 2	Day 3
<p>Opening</p> <p>Session 1 : Response actions to aquatic animal disease emergencies</p> <p>1.1 National Competent Authority: role and experiences Presentations: China, Ghana, Indonesia, Norway, Philippines, Thailand, Vietnam, USA, Zambia</p> <p>1.2 Intergovernmental organization: role and activities/experiences related to investigating specific mass mortalities of aquatic animals Presentations: NACA, OIE, FAO</p>	<p>Session 1: continued Producer and research/academic sectors: role and activities/experiences related to investigating specific mass mortalities of aquatic animals Presentations: MSD, IZSV, WVR, CEFAS, MSU <u>Working Group Activity 1:</u> Essential elements of an effective and timely response action to aquatic animal disease emergencies WG presentations and discussions</p> <p>Session 2: Review of the draft annotated contents outline FAO document on <i>Decision-tree for dealing with aquatic animal mortality events</i>, incorporating lessons learned from Day 1 Presentation: Decision Tree and contents outline for the associated technical guidelines</p> <p><u>Working Group Activity 2:</u> Discussion and recommendations for Development and Revision WG presentations and discussions</p>	<p>Session 3: Considerations for developing a framework for systematic impact assessment of aquatic animal diseases Presentation: Global Burden of Animal Diseases (GBAD)</p> <p><u>Working Group Activity 3:</u> Considerations for developing a framework for the systematic impact assessment of aquatic animal diseases WG presentations and discussions</p> <p>Session 4: Identifying key elements for a project proposal to improve national response actions to aquatic animal disease emergencies</p> <p>Session 5: Moving Forward and Closing</p>

Products

- Summaries of experiences and lessons learned on response actions to aquatic animal disease emergencies
- Recommendations for further development of the *FAO Decision-tree for dealing with aquatic animal mortality events* and supporting guidance
- Considerations on a framework for the systematic impact assessment of aquatic animal diseases
- Recommendations for the development of a project for improving national government and private-sector response actions to aquatic animal disease emergencies
- A meeting report, including summaries of all presentations and results and recommendations arising from the Working Group activities and plenary discussions.