



Food and Agriculture
Organization of the
United Nations

The Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB)

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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



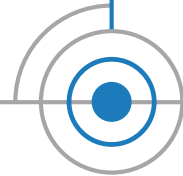
1980s



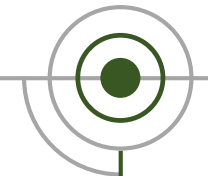
1990s



2000s



Future

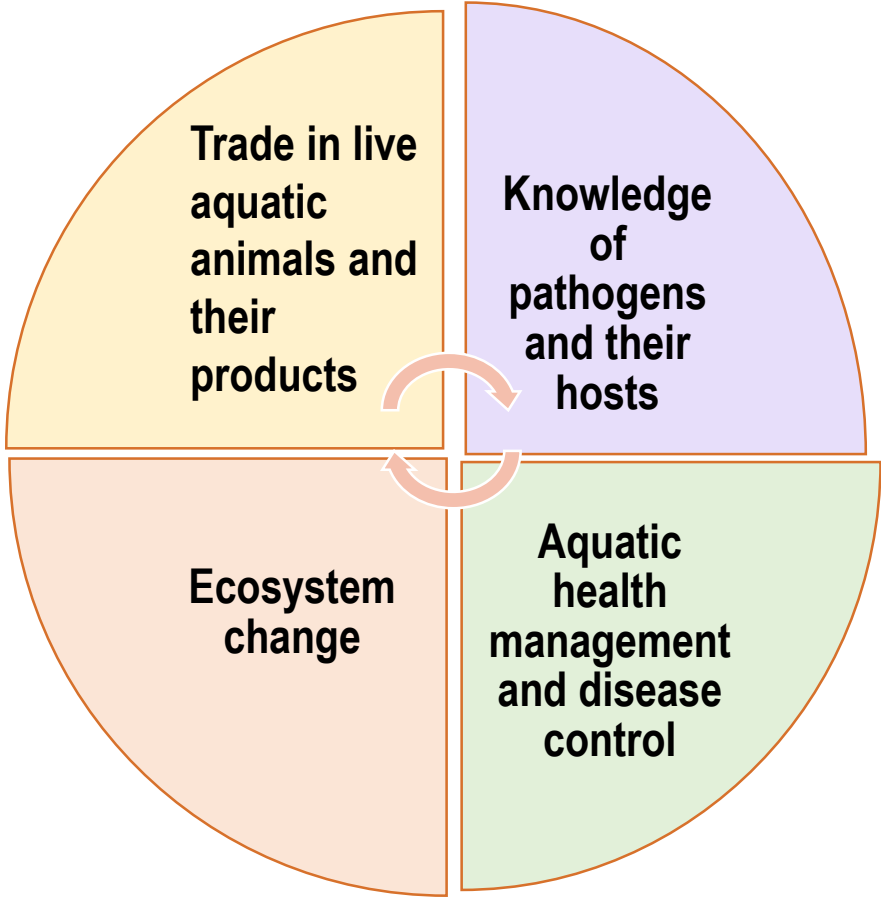
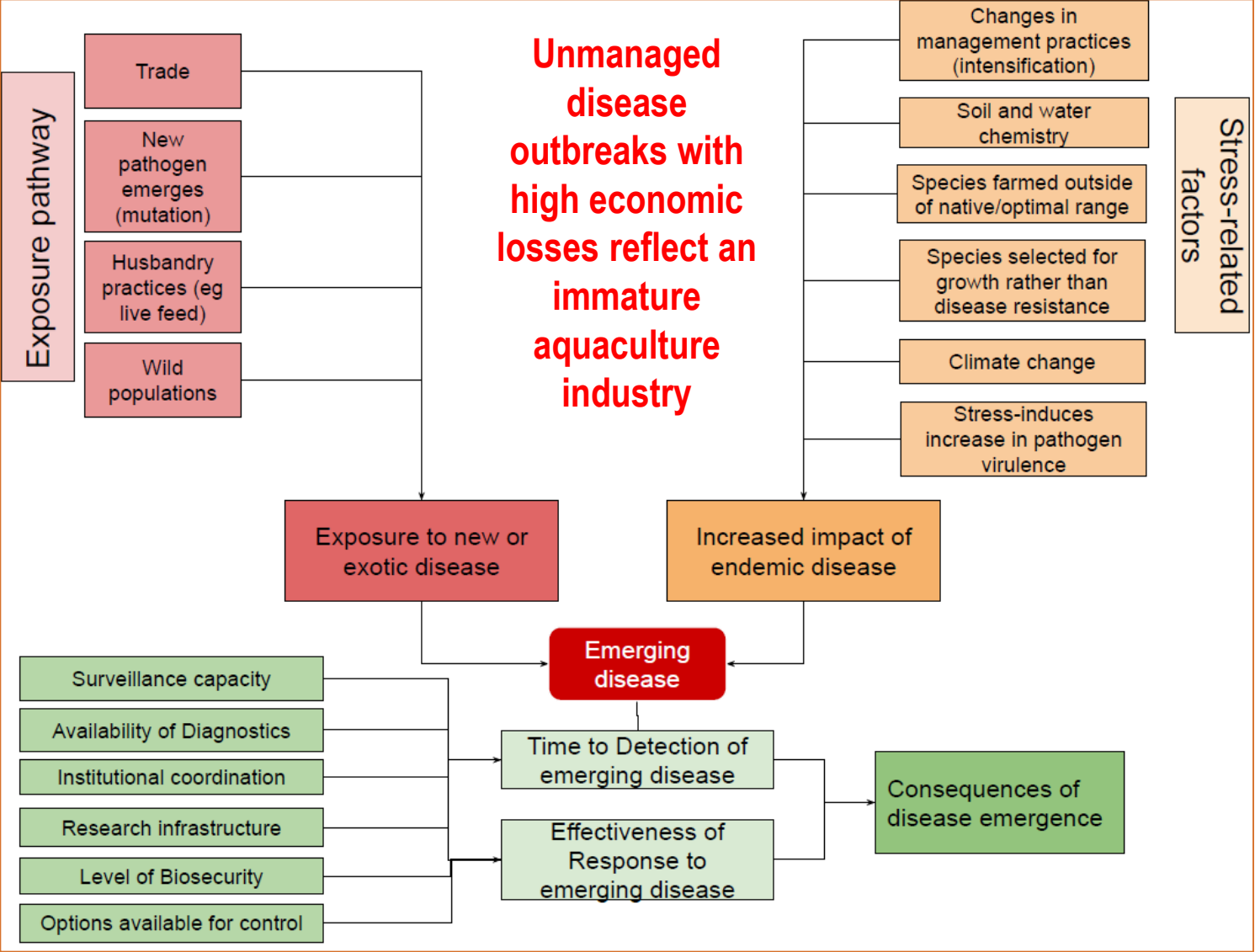


Gyrodactylus (salmon) 
MBV (shrimp) 
LCDV (tilapia) 
EUS (many finfish)

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

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

Aquaculture Disease Emergence Pathways/Drivers and Causal Web



The **current approach** to disease challenges needs to be supplemented with an **economic dimension** for improved responses and more efficient resource allocation.

Progressive Management **Pathway** for Improving **Aquaculture Biosecurity (PMP/AB)**

- PMP/AB refers to a **pathway** aimed at enhancing **aquaculture biosecurity** by **building on** existing frameworks, capacity and appropriate tools using **risk-based** approaches and **public-private partnerships**
- PMP/AB is expected to result in **sustainable**:
 - **reduction** of burden of disease
 - **improvement** of health at farm and national levels
 - **minimization** of global spread of diseases
 - **optimization** of socio-economic benefits from aquaculture
 - **attraction** of investment opportunities into aquaculture and
 - **achievement** of One Health goals
- *In the context of PMP/AB: **Aquaculture biosecurity:***

*Biosecurity refers to the **cost-effective management of risks** posed by **infectious agents** to aquaculture through a **strategic approach at enterprise, national and international levels** with **shared public-private responsibilities**.*

<http://www.fao.org/3/ca9229en/CA9229EN.pdf> (pages 190-193, SOFIA 2020)

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(pages 190-193, SOFIA 2020)

**Biosecurity
risks
defined**

Stage 1

Stage 2

**Biosecurity
systems initiated**

**Biosecurity &
preparedness
enhanced**

Stage 3

Stage 4

**Sustainable
biosecurity &
health
management
systems
established**

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

Each stage has key outcomes and minimum requirements

National Strategy on Aquatic Animal Health within the PMP/AB

<http://www.fao.org/3/a1108e/a1108e00.pdf> (FAO, 2007)



- Stage 1
- Stage 2
- Stage 3

- ✓ Risk-based
- ✓ Main component of PMP/AB
- ✓ Activities continuously applied/improved in higher Stages

COFI/SCA 10th Session (Norway, 23-27 August 2019):

5/9 recommendations

Welcomed the **PMP/AB**

Agreed to the development of a **multi-donor assisted long-term component on aquaculture biosecurity** including the 5 pillars

Requested the formation of an **FAO Technical Working Group** to develop the PMP/AB and associated tools and mechanism

Urged the **pilot testing of PMP/AB**
Recommended improving **PMP/AB communication streams**

<http://www.fao.org/3/ca7417t/CA7417T.pdf> (pages 3-4)

Pillar 1: Disease prevention at farm level through responsible fish farming (including **reducing AMR in aquaculture**)

Pillar 2: PMP/AB, enhancing interpretation and implementation of **international standards** and strengthening the **One Health** approach

Pillar 3: Aquaculture health economics (burdens and investments, opportunity cost);

Pillar 4: 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).



Conclusions

- **Biosecurity** should be in place and **parallel to any aquaculture development** by all producing countries
- Biosecurity measures are **less expensive** when put in place **proactively and preventatively**, and are **more expensive** as **solution-based, reactionary responses** to outbreaks
- **PMP/AB can offer**
 - **co-management approach, greater use of planning processes that brings stakeholders together = a solid platform for public-private sector partnership**
 - **risk ownership, active engagement and long-term commitment to risk management**
 - **governance mechanism and a range of toolkits**
 - **specific entry points for any country**
 - **opportunity for longevity, sufficiently responsive to environmental and anthropological challenges, enabling policy environments, adoption of sound aquaculture production practices**



Creating healthy and resilient hosts through a combination of better health, genetics and nutrition are needed for a maturing aquaculture industry.

