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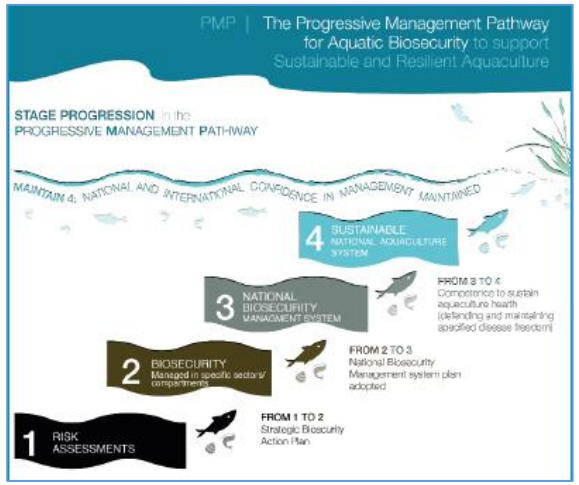
Outcomes of a Multi-Stakeholder Consultation on Progressive Management Pathway (PMP) to Improve Aquaculture Biosecurity

World Bank Headquarters, Washington, D.C. 10-12 April 2018

Melba Reantaso
Melba.Reantaso@fao.org

Purpose

- **took stock** of the current aquatic animal health and biosecurity situation in aquaculture with a view to identify the bottlenecks and root causes.
- **introduced a new concept** to address aquatic disease problems **- Aquaculture Biosecurity Progressive Management Pathway (PMP**). The PMP is a step-wise risk management framework that should introduce the building blocks for biosecurity capacity that are relevant to national needs at every stage
- **built consensus** on the PMP approach with the aim of developing a **global Plan of Action.**



Participation: n=40

- Governments
- Regional and international intergovernmental organizations
- Industry
- Academe
- Development aid agencies and foundation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FAO/MSU/WB Stakeholder Consultation on
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Diseases in aquaculture: from largest aquaculture-related epizootics

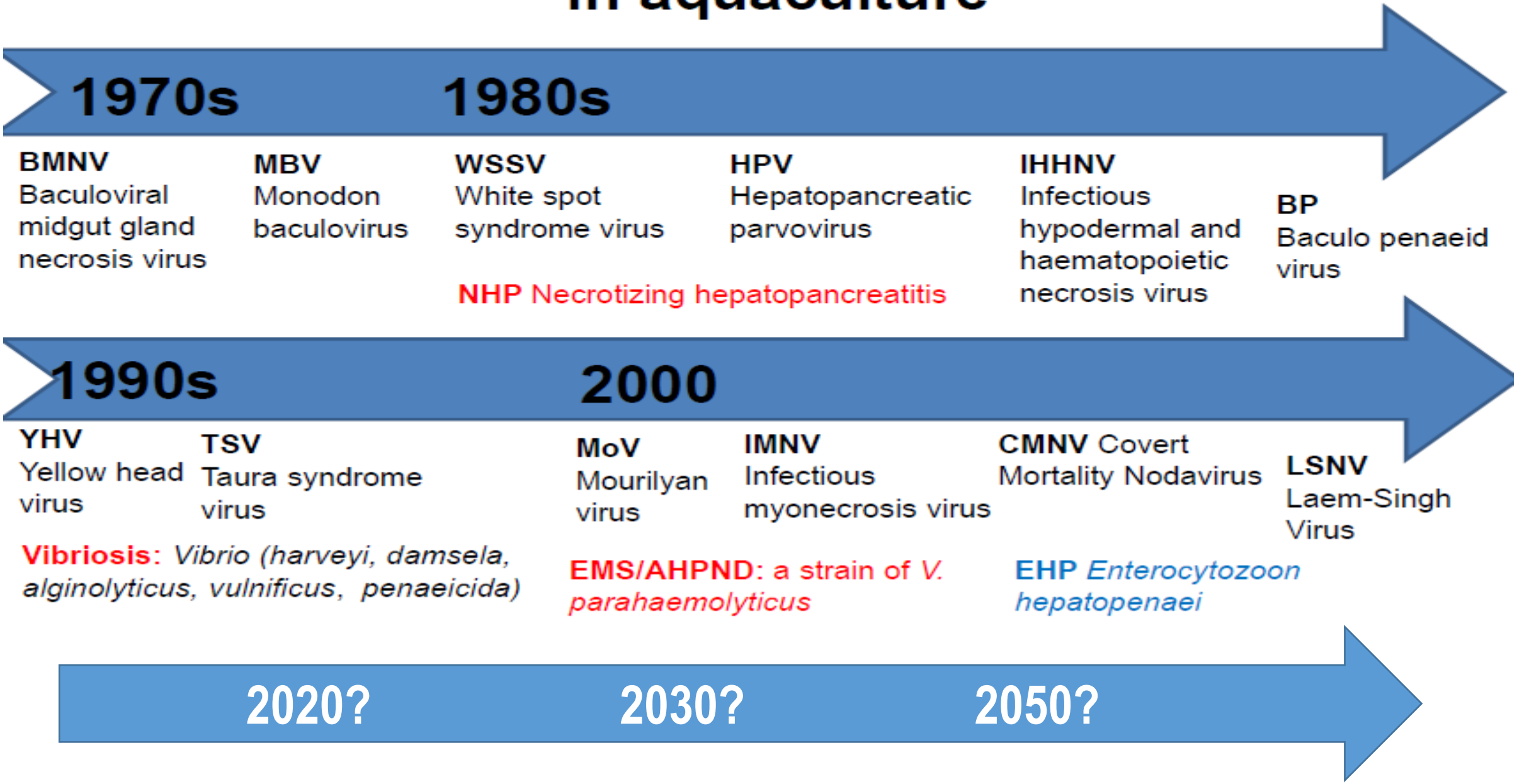
Disease (observation in the field)	Diagnosis	Reporting /communication (national or OIE)	Containment (vaccine, treatment, husbandry)	Management (cost-effective)	Disease freedom	National and international confidence to the sector
EUS (1970s): fungi	1980s		?			
WSSV (1980s): virus	mid-1990s		?			
KHV (2000s): virus	mid-2000	OIE: 2006	?			
AHPND (2009): bacteria	2013	OIE: 2016	?			
TiLV (2009): virus	2014	Still being assessed	2018 ?			

Long time lapse: years

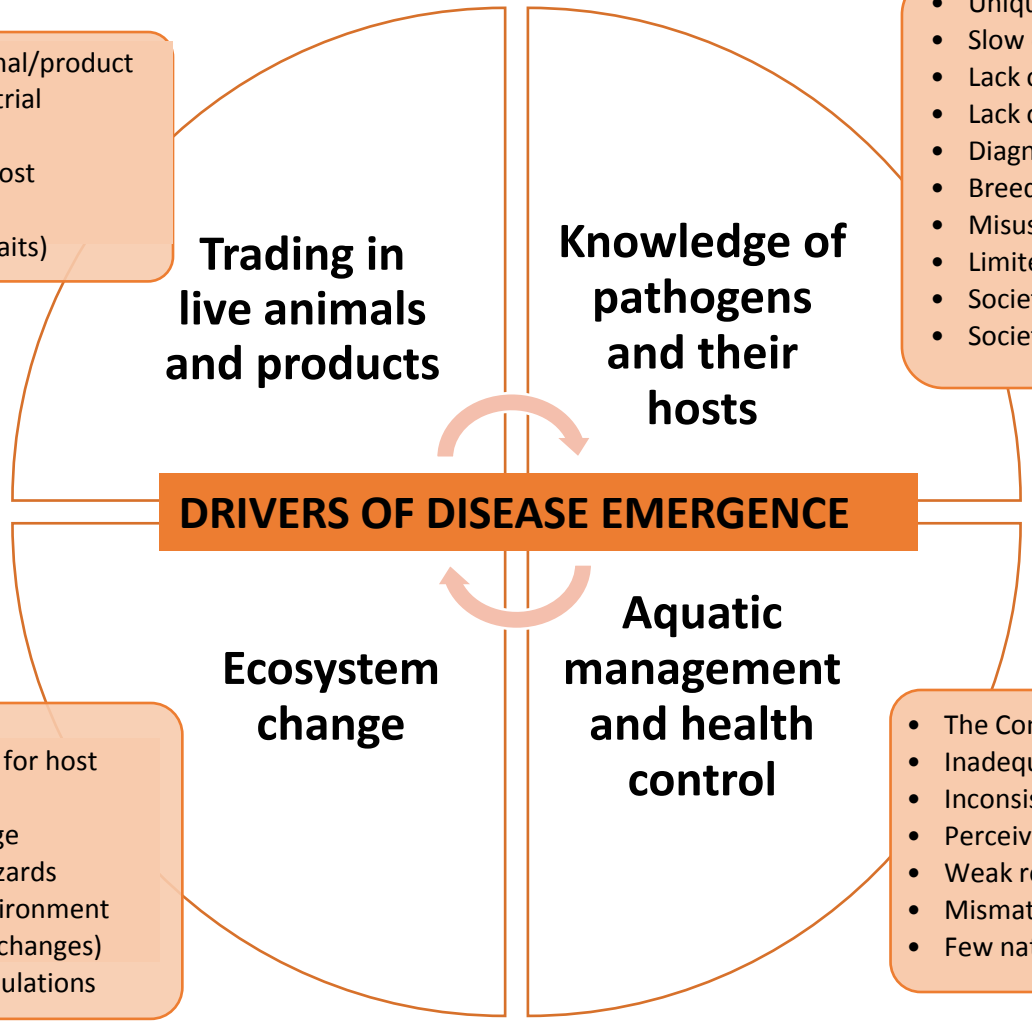
$$$$ losses: production, market = livelihoods, export earnings, food supply
= socio-economic and environmental impacts

$$$ spent: producers/government/academe: biosecurity (policies, prevention, diagnosis, surveillance, containment, training/education, research, trade disputes, etc); compensation; alternatives)

Chronology of shrimp pathogen emergence in aquaculture



Drivers of emergent disease in aquaculture



- Highly traded (70% exposed to int. trade). Live animal/product
- Hyper-diverse sp. range (>500) compared to terrestrial
- Many sp. farmed outside of native range
- Invasive sp. (incl. pathogens) traded with primary host
- Ornamental aquaculture trade is large and growing
- Some diversion to unintended usage (e.g. angling baits)

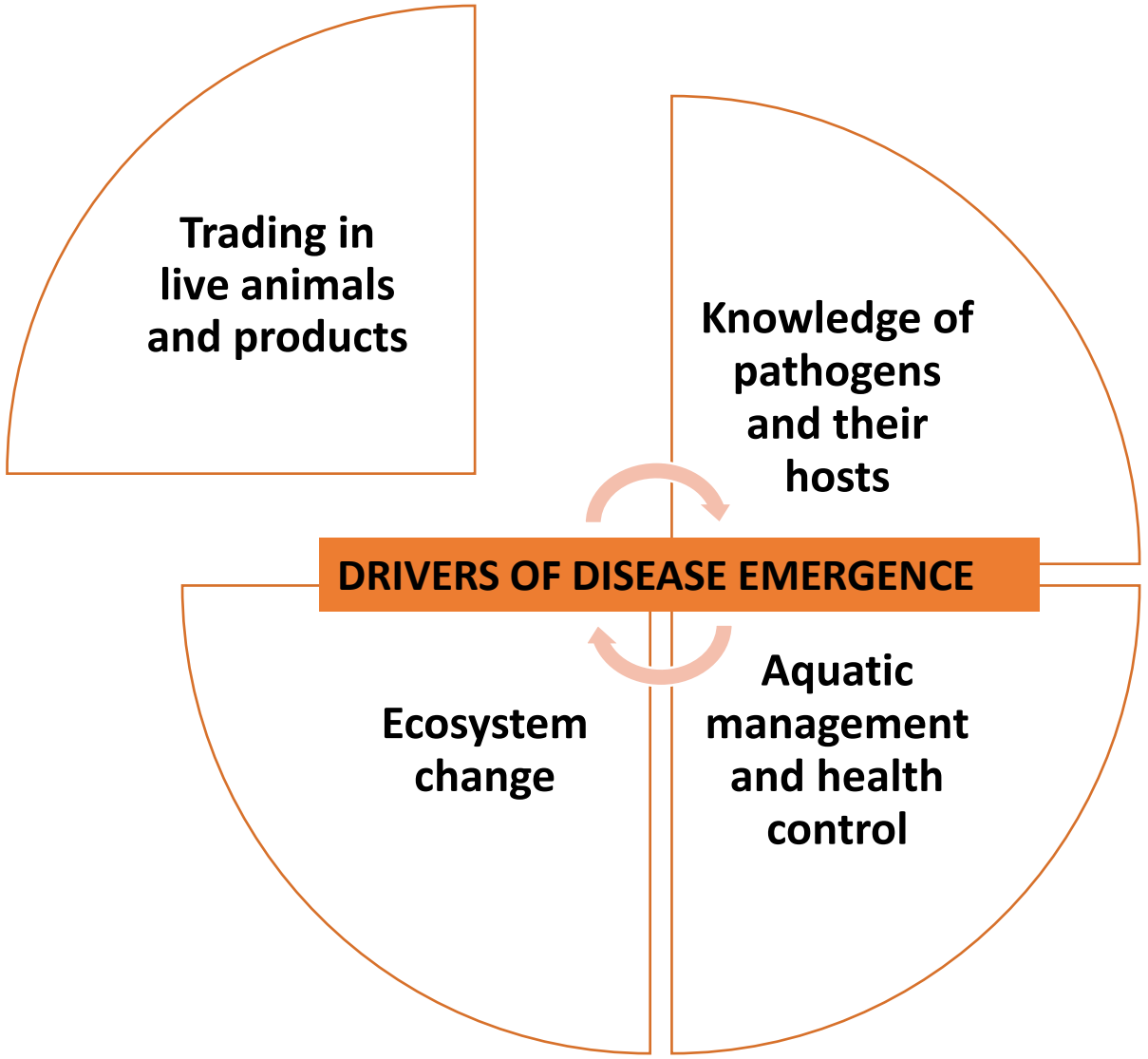
- Unique aquatic medium
- Slow collective awareness of new threats
- Lack of basic pathogen data (e.g. transmission)
- Lack of basic host data (e.g. immunity, genetics)
- Diagnostics focussed on known/listed diseases
- Breeding strategies often not in place
- Misuse of stock (e.g. SPF) in some cases
- Limited availability of vaccines/other credible control options
- Societal barriers to innovative control/surveillance strategies
- Societal barriers to innovative genetics (e.g. GMO)

- Physico-chemical conditions in aquaculture sub-optimal for host
- Cold-blooded hosts (highly responsive to stressors)
- Animals may be farmed outside of native/optimum range
- In waters in which they are naïve to native microbial hazards
- Aquatic medium pathogen rich, diversity shifts with environment
- Some hosts (e.g. crustaceans) calcify (susceptible to pH changes)
- Pathogens evolve, spill-over/spill-back to/from wild populations

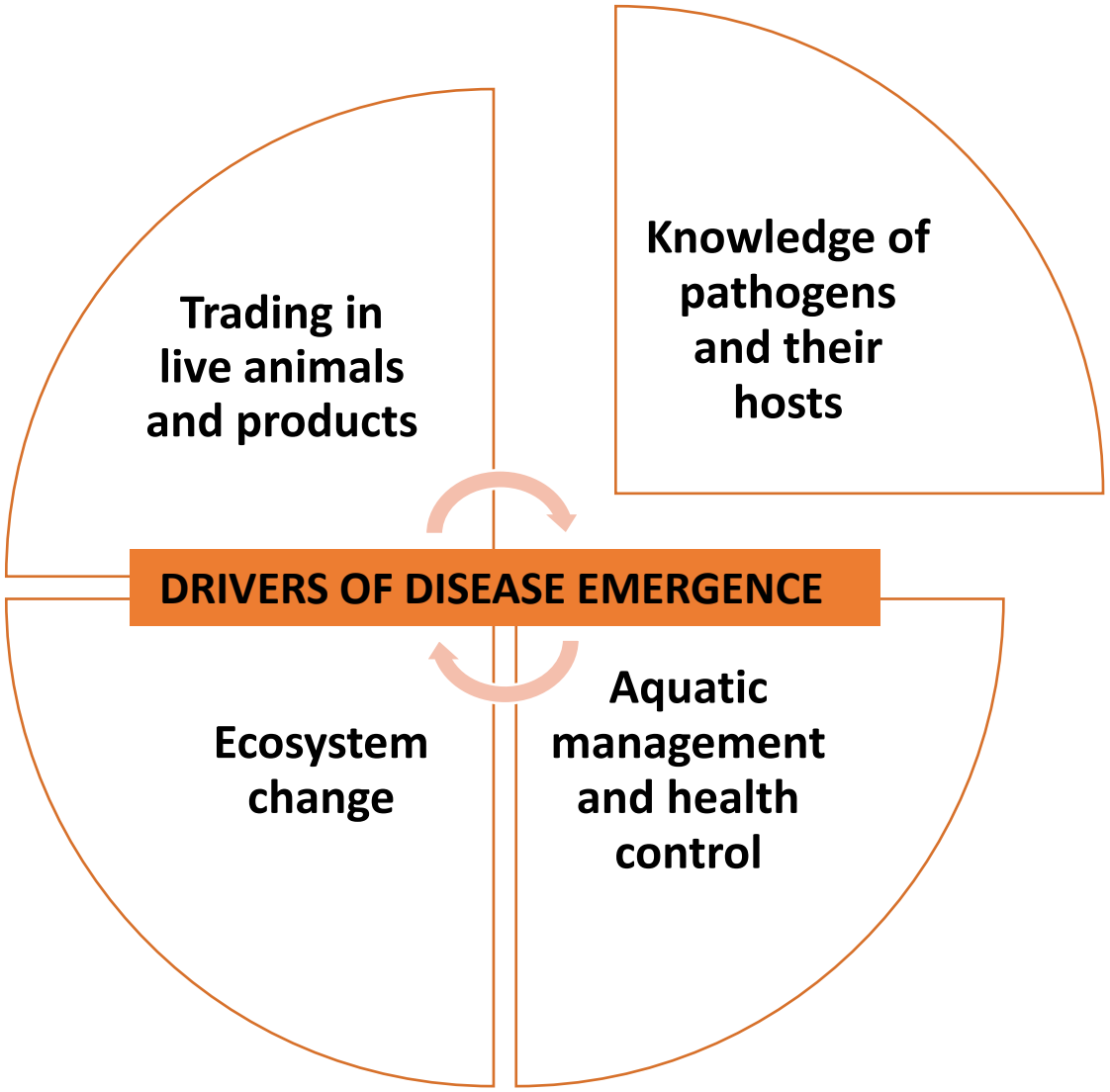
- The Competent Authority? (multi-bodies involved with AHM)
- Inadequate/poorly-implemented biosecurity/response strategies
- Inconsistent/weak implementation of international standards
- Perceived low incentive to report known/emergent diseases
- Weak regulatory framework, poor public-private partner working
- Mismatch between research agenda/industry need
- Few national pathogen/host inventories

Drivers of emergent disease in aquaculture

- Highly traded commodity (70% exposed to international trade)
- Hyper-diverse species range (>500) farmed compared to terrestrial systems
- Live animals (larvae, fry, adults) and their products (live, fresh, frozen) traded internationally
- Many species farmed outside of native range
- Invasive animals and pathogens can be traded with primary host
- Ornamental aquaculture trade is large and growing
- Some diversion to unintended usage (e.g. angling baits)

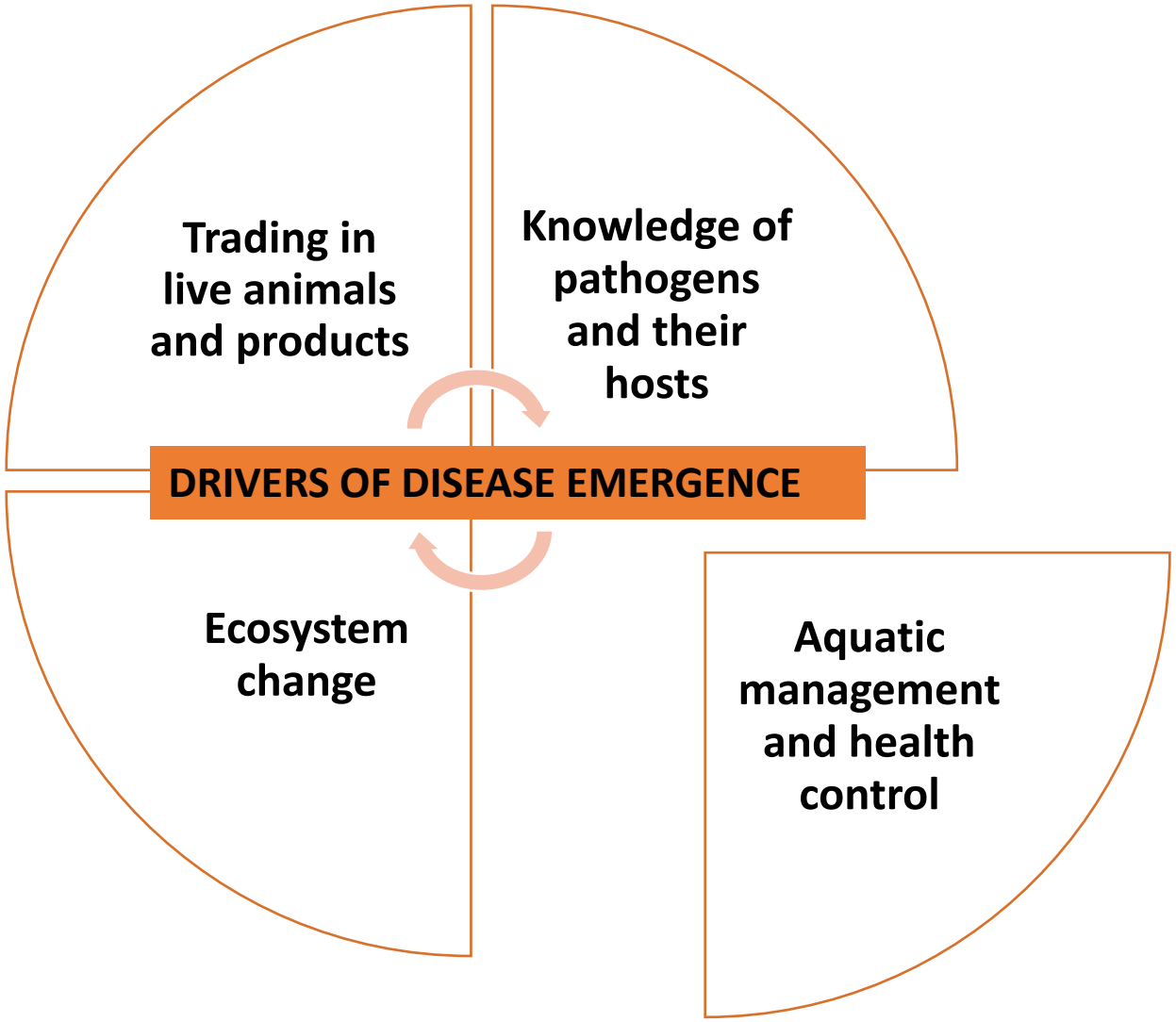


Drivers of emergent disease in aquaculture



- The unique aquatic medium
- Slow collective awareness of new threats
- Lack of basic pathogen data (e.g. transmission)
- Lack of basic host data (e.g. immunity, genetics)
- Diagnostics focussed on known/listed diseases
- Breeding strategies not in place for many species (e.g. SPF, SPR, selective breeding)
- Misuse of stock (e.g. SPF) in some cases
- Limited availability of vaccines (fish) and other credible control options (invertebrates)
- Societal barriers to innovative control/surveillance strategies (e.g. POND)
- Societal barriers to innovative genetics (e.g. GMO)

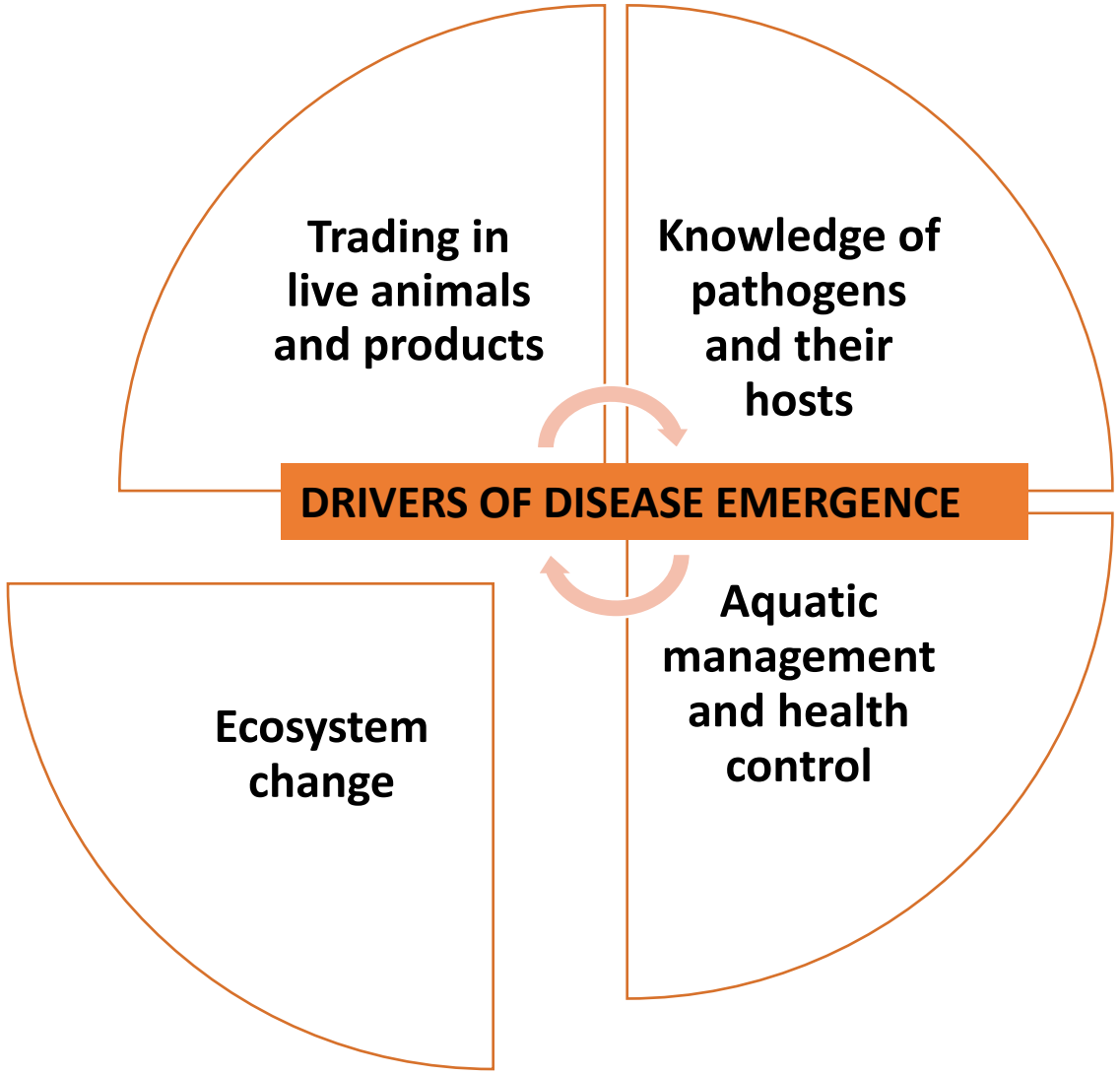
Drivers of emergent disease in aquaculture



- 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

Drivers of emergent disease in aquaculture

- Physico-chemical conditions in aquaculture are often sub-optimum for host
- Aquatic hosts are cold-blooded (highly responsive to stressors)
- Animals may be farmed outside of native/optimum range
- and, in waters in which they are naïve to native microbial hazards
- Aquatic medium is pathogen rich, diversity changes with environment conditions
- Some hosts (e.g. crustaceans, molluscs) must calcify (susceptible to acid-base changes)
- Pathogens evolve and spill-over and spill-back relative to wild popilations



What can we do?

Before the disease or after

Prevention	?	Solution
Pro-active	vs	Reactive
<$$	vs	>$$$$$$$

What is a Progressive Control Pathway (PCP)?

Step-wise approaches are increasingly used for the **reduction**, **elimination** and **eradication** of a range of major livestock and zoonotic diseases including**:**

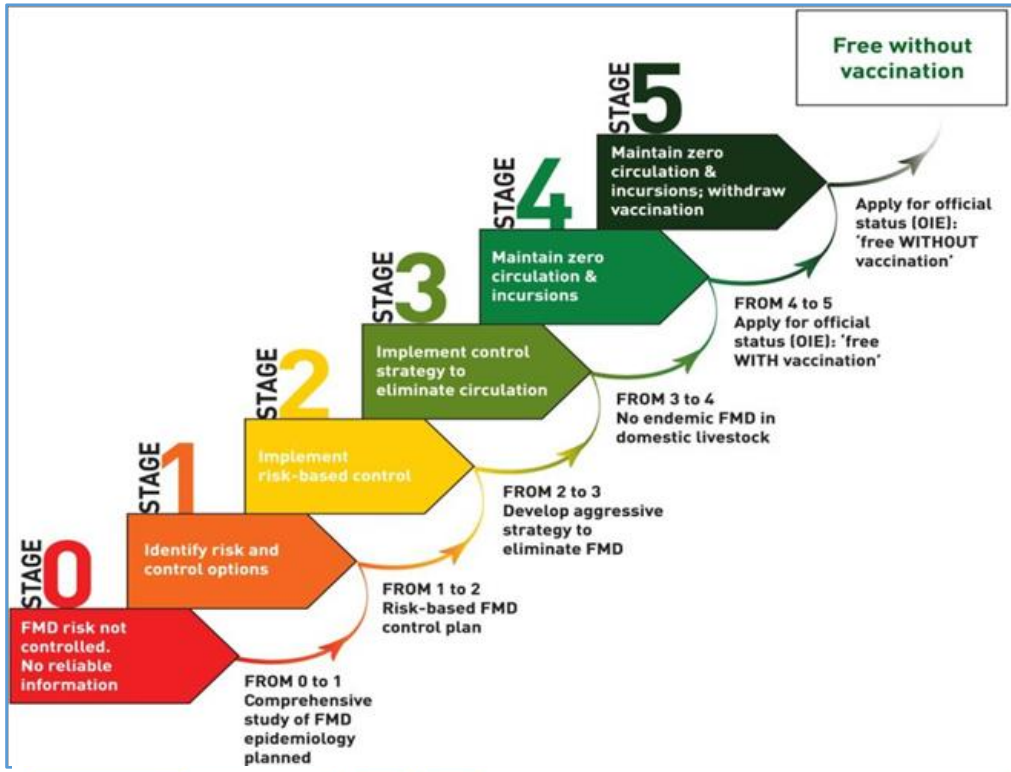
- **Foot and Mouth Disease (FMD)**
- **Peste des Petits Ruminants (PPR)**
- **Rabies**
- **African Animal Trypanosomosis (AAT)**

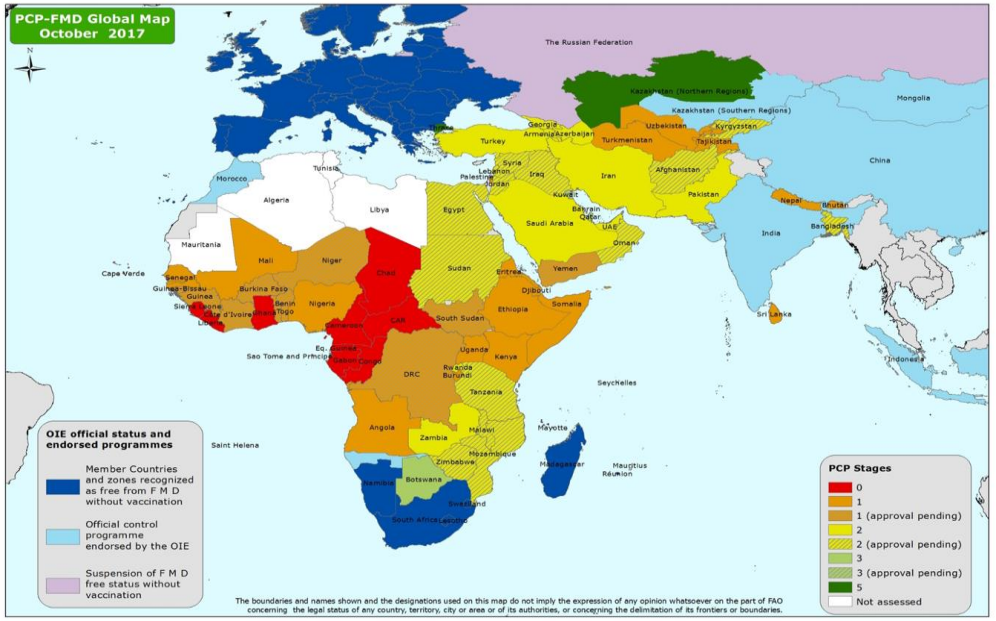
PCPs provide systemic frameworks for **planning** and **evaluating** field interventions and **enable** realistic disease control objectives to be defined and achieved.

PCPs have been used since 2008 by FAO and become adopted as joint tools with the OIE (FMD, PPR) , or developed/owned by global alliances (rabies, AAT)

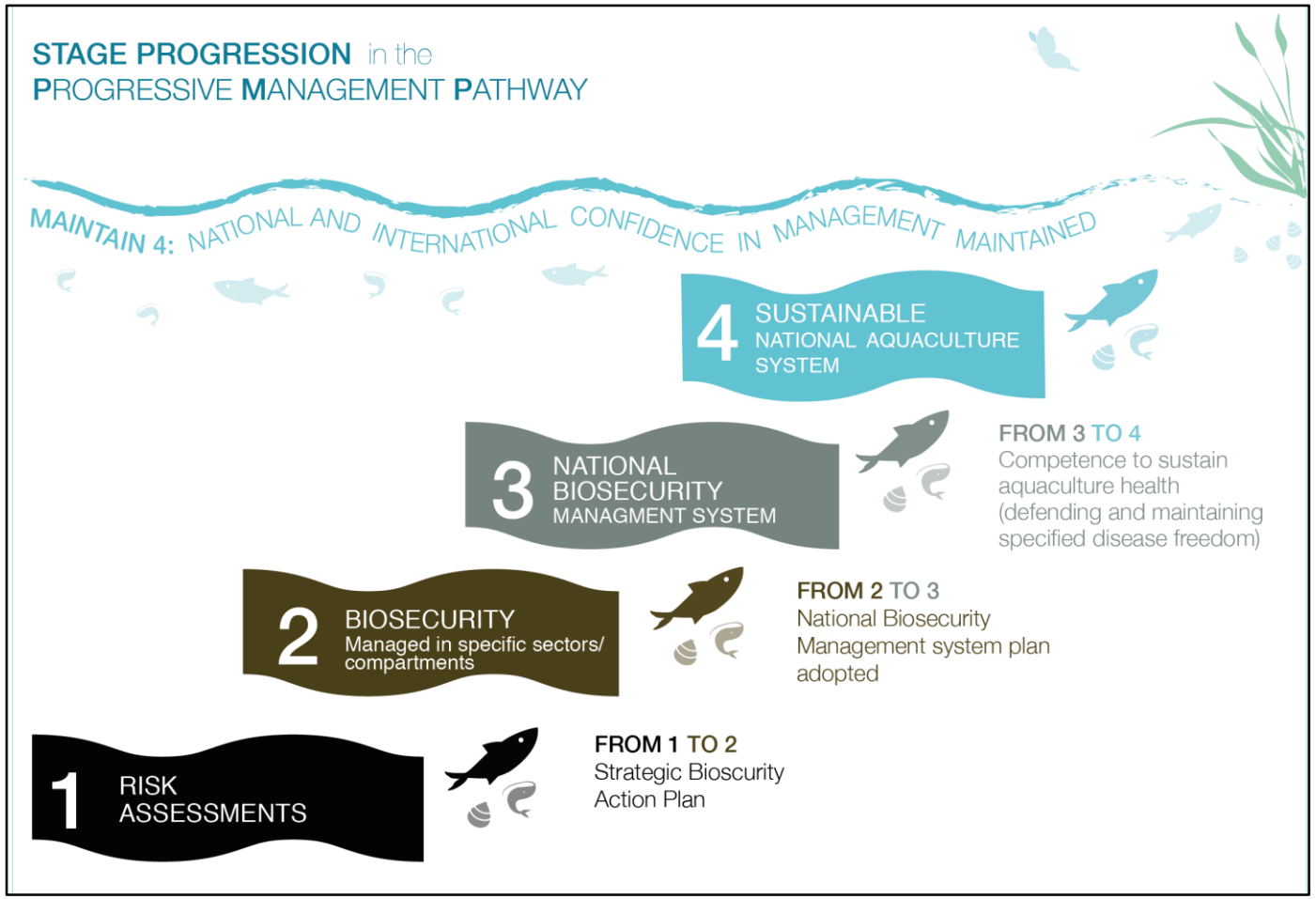
PCP - FMD

- Developed by FAO and EuFMD in 2008
- 5 stages that progressively increase the level of FMD control
- Consist of set of activities focused on identifying and addressing the risk for FMD introduction and spread
- Intended to assist FMD-endemic countries to progressively reduce the impact and burden of FMD





PMP | The Progressive Management Pathway for Aquatic Biosecurity to support Sustainable and Resilient Aquaculture



4 stages
Risk-based
Collaborative
Progressive

- May be applied at a **National level**, or targeted **geographically**
- Each stage has **well-defined outcomes** which are achieved through a variety of activities
- **Evidence based** and **transparent assessment** of stage of a country (or zone) proposed through data collection and audits
- **Fast-track system** can be considered for enter into advanced stages (providing evidence for meeting stages entry requirements)

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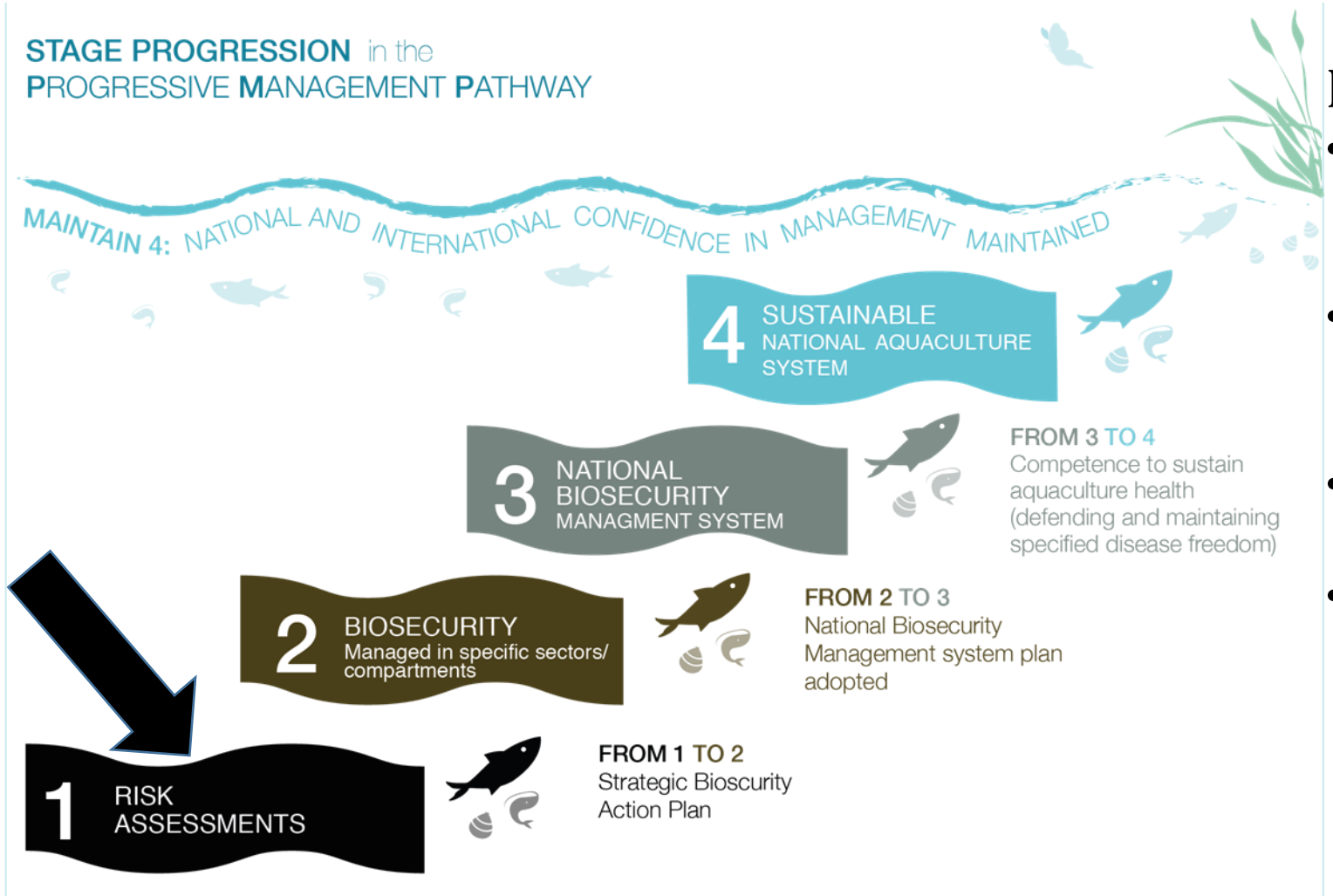

PMP Stage 1 focus -

- Creation of a national strategy that has confidence and support of the **stakeholders** (private and public)
- Addresses **principal hazards** and **risks** that affect aquaculture health and production
- **Aim** - common agreement on a long term vision
- Each country will need to complete its **Strategic Biosecurity Action Plan** which will be the 'gateway pass' to enter **Stage 2**

Stage 1 : Gain understanding of level of Biosecurity by doing a preliminary assessment and develop a **Risk Assessment**

Develop a Risk Assessment:

- **Identify hazards**: pathogens, mapping risks and gaps in the system, identify any negative impact on the ecosystem
- **Periodic checks** e.g. every trimester or every 6 months
- Development of **Strategic Biosecurity Action Plan** in order to progress to Stage 2

Stage 1 : Achievements

At National level, public/private task force

Establish co-regulation and co-ownership of the pathway between public and private sector stakeholders

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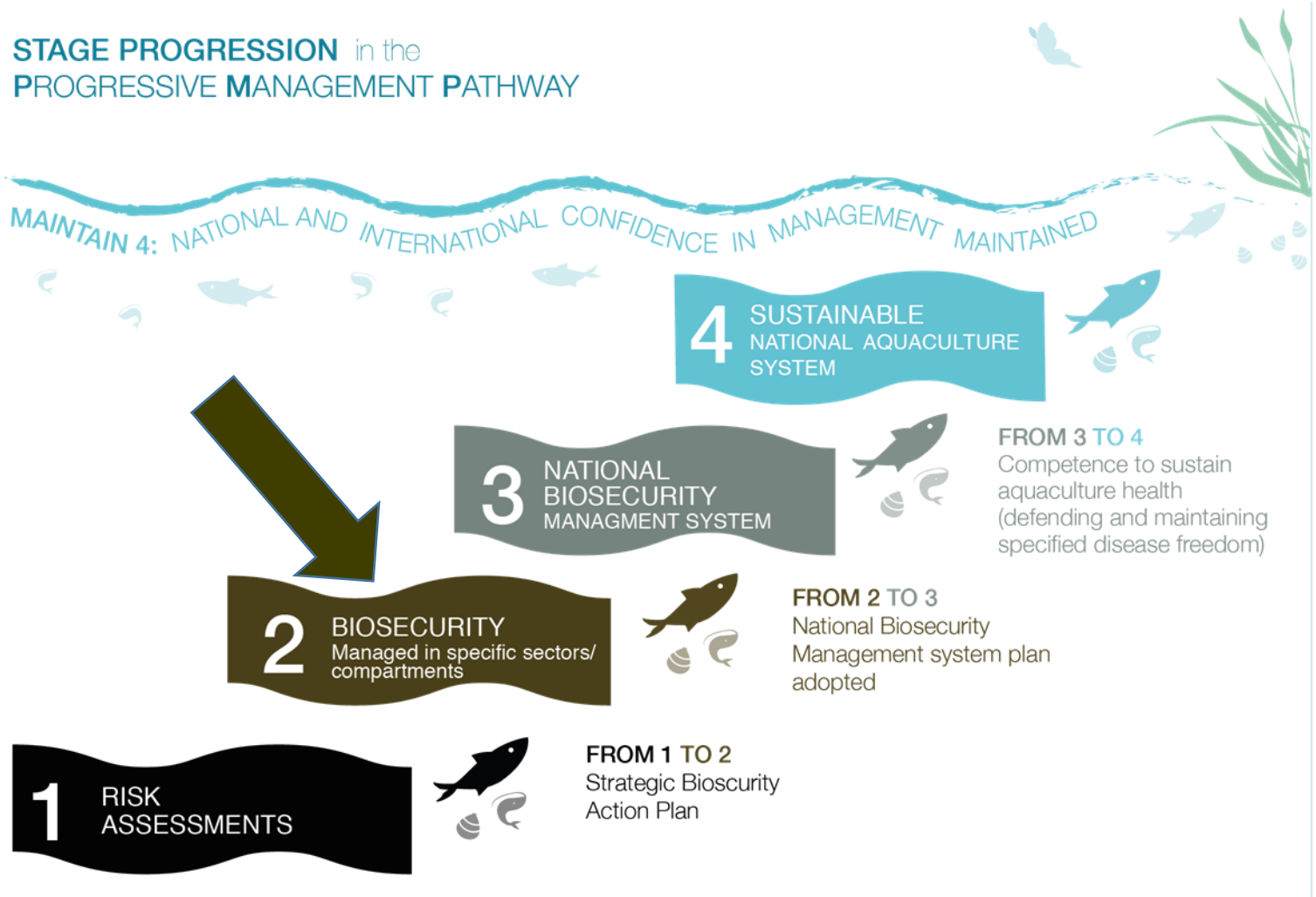

PMP Stage 2 focus -

- **Implementation** of a **Biosecurity Action Plan** in specific sectors/compartments
- **Co-management** is expected to continue and strengthen the implementation and the improvements
- Should this stage move forward additional biosecurity efforts at ports and borders must be included
- Countries will need: **evidence** Strategic Biosecurity Action Plan implementation, & **commitment** through a National Biosecurity Management System in order to enter **Stage 3**

Stage 2 : Implementation of Biosecurity

This should be achieved by giving constant training to all involved parties (private and public)

Evidence of implementation is done through:

- Inspections/Surveillance
- Monitoring
- Reporting
- Evaluation

Once a certain threshold is achieved through a combination of all of the above, it would be the gateway to Stage 3. All the achievements must be monitored and evidenced in order to move forward to **Stage 3**

Stage 2 : Achievements

Task force to monitor and evaluate progress in engagement with enterprise and sector levels

- Evidence of sufficient stakeholder application of **Biosecurity Plan**
- Evidence that task force is effective and problems encountered are being addressed

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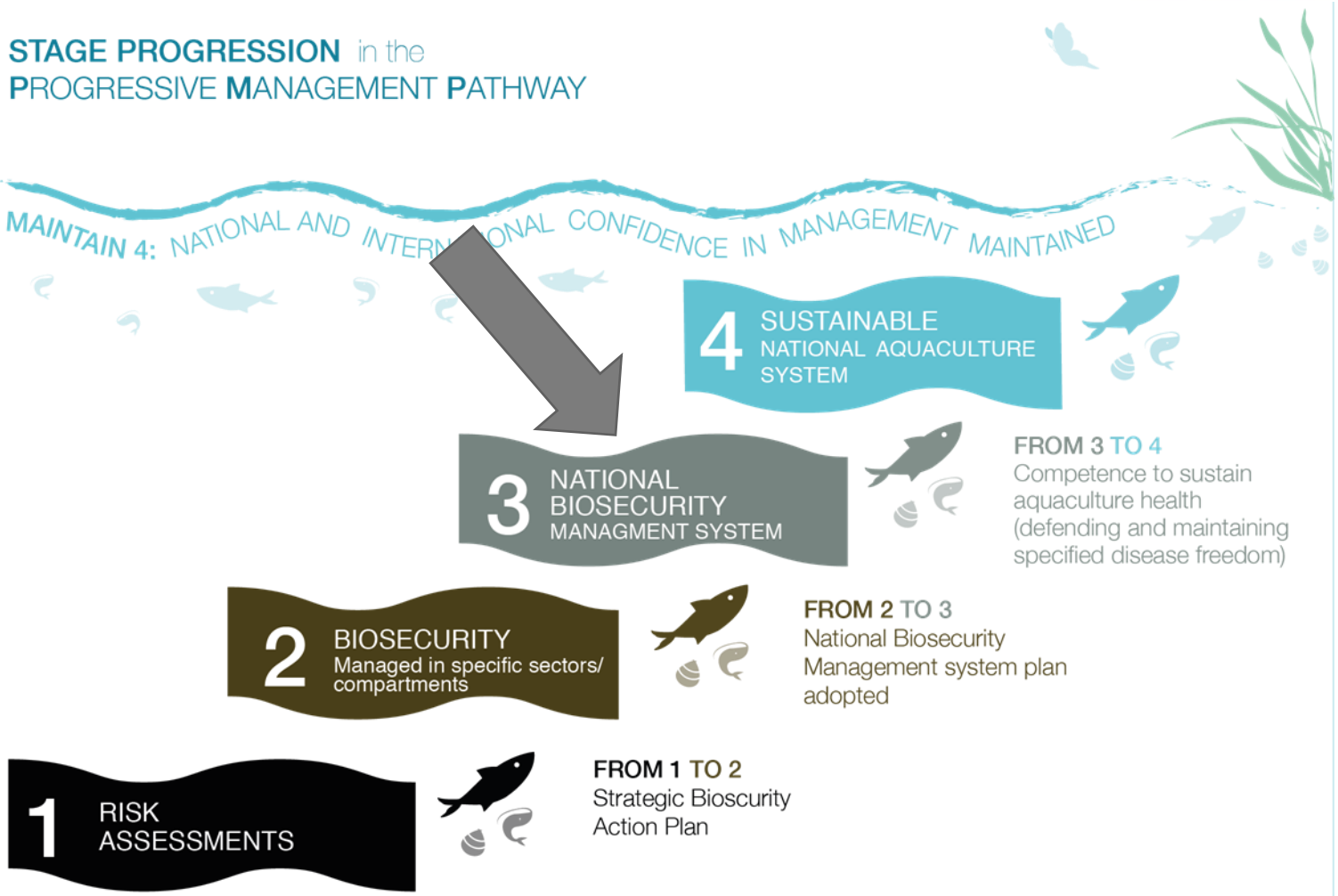

PMP Stage 3 focus -

- Zoning, restrictions of movement and reporting of any disease/emerging problems through constant surveillance should be in place
- Once the management system is found to be capable to sustain the Aquaculture health by defending and maintaining specific disease freedom it can move forward to **Stage 4**

Stage 3 : National safeguarding and sustaining progress

The management capacity should be sufficient to safeguard the level of investments (private and public entities)

Disease/risks should be managed by a combination of:

- Public efforts
- Policies
- Legislation
- Producer interest and engagement

At this stage specific diseases should be under control within the country, with sufficient attention and actions taken against any posed threats

- The **maturity of the system** for monitoring Aquaculture health, specific diseases, evidence of stakeholders support and their participation in achieving this progress are required to move onto **Stage 4**.

The system is expected to be an integral part of a **National Policy and plan for Aquaculture**, and addressing the system, roles and responsibilities required to safeguard health of the sector, consumer and the environment.

Stage 3 : Achievements

National, multi agency task force with capacity for effective regulation of Biosecurity change with producers

- Evidence of performance indicators for a functional national system which addresses risks
- Increase systematic surveillance
- Evidence of health status – **pathogen freedom**

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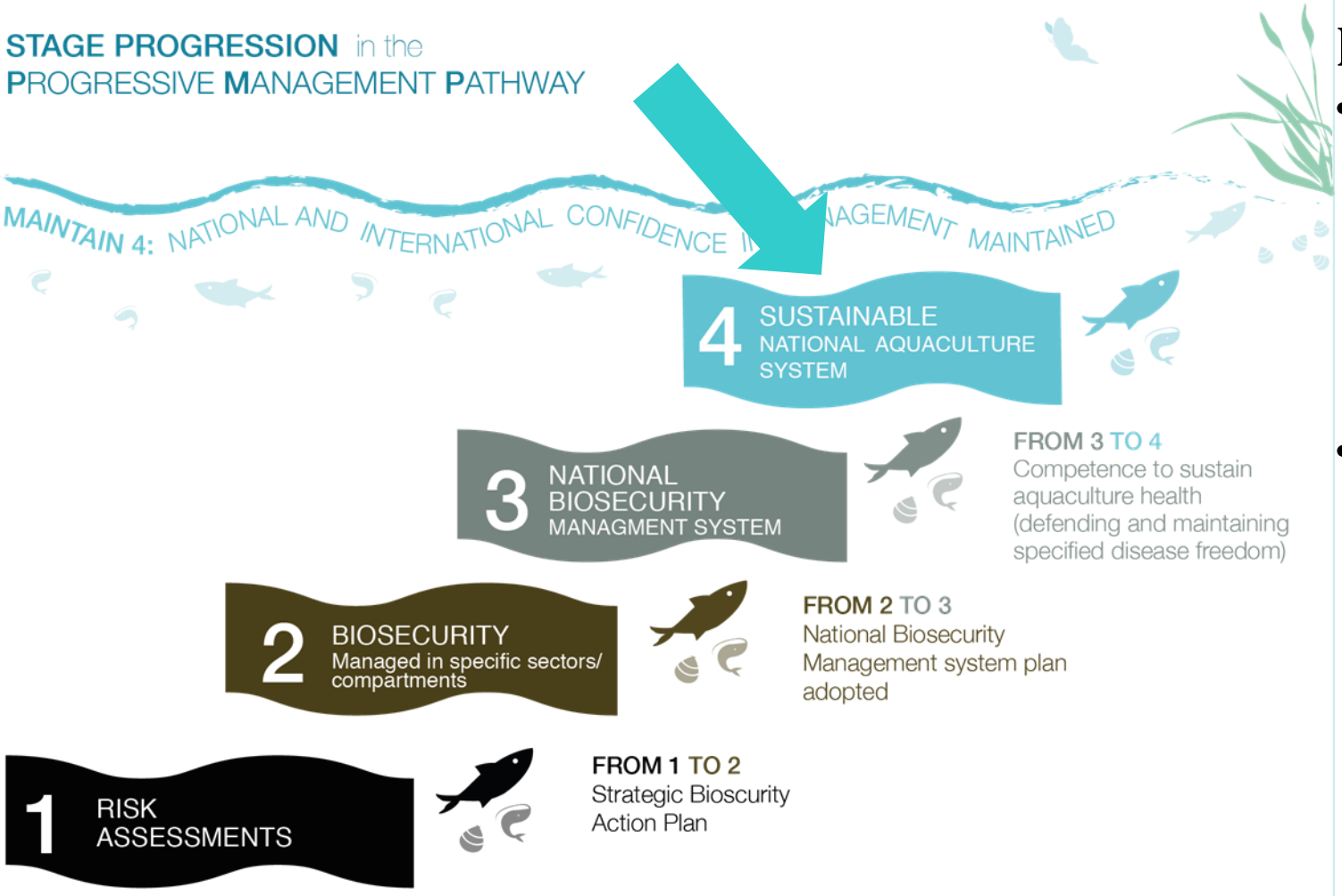

PMP Stage 4 focus -

- End stage - **Achievement** of a **Sustainable and Resilient National Aquaculture System** acquired through the capacity to maintain confidence, biosecurity system, emergency preperdness and preventive measures
- All these activies must be co-ordinated and maintained, otherwise a 'downgrading' of the PMP status may result

Stage 4 : Achievements

National long term commitment of maintenance of the system for Aquaculture and Ecosystem

- Evidence of National policy supported in law with legal and financial commitments
- Evidence base supports confidence in National Aquaculture and Ecosystem health, and in capacity to prevent and respond to any threat at National level

Benefits of the PMP

- At National level it addresses the lack of clear national plans through a focus on: national strategy development processes, mid- to long-term and promoting a co-management approach
- Brings stakeholders together with a variety of benefits
- Builds the basis for national, public and private co-management of Biosecurity

Objectives and Achievement

Objectives	Expected outcomes and achievement
take stock of the current aquatic animal health and biosecurity situation in aquaculture with a view to identify the bottlenecks and root causes	Better understanding of the bottlenecks and root causes of aquatic disease emergence in aquaculture: YES
introduce a new concept to address aquatic disease problems - **Aquaculture Biosecurity Progressive Management Pathway (PMP**).	Better understanding on PMP and how this tool might be used to address aquaculture biosecurity and aquatic animal health: YES
to build consensus on the PMP approach with the aim of developing a **global Plan of Action.**	Build consensus on this new approach – PMP to improve aquaculture biosecurity: YES Develop a Global Plan of Action: NOT QUITE! BUT some follow-up work

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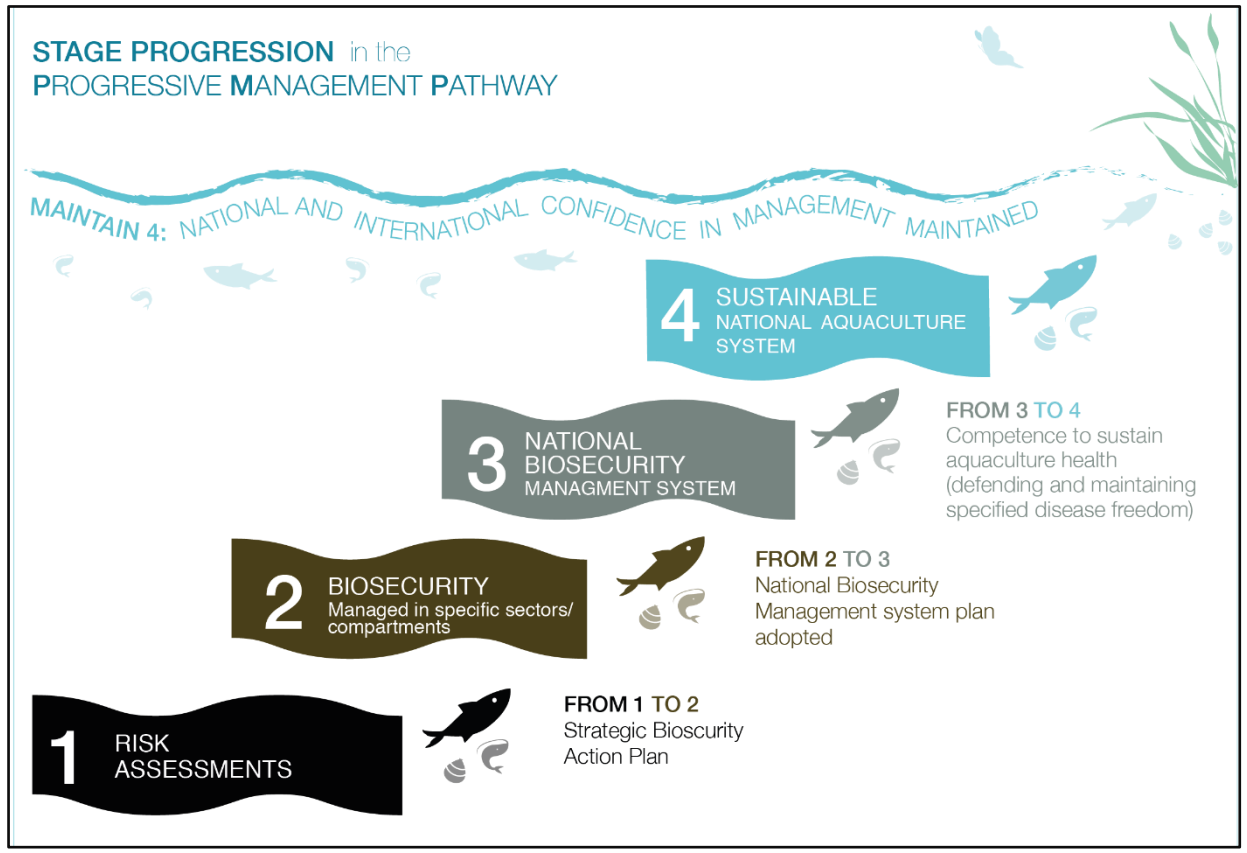

General consensus/broad acceptance and usefulness of the tool

PMP works for moving countries forward in a guidance context.

Should be applied to improve biosecurity for all forms of aquaculture production scope and objectives – small to large; local to international traders.

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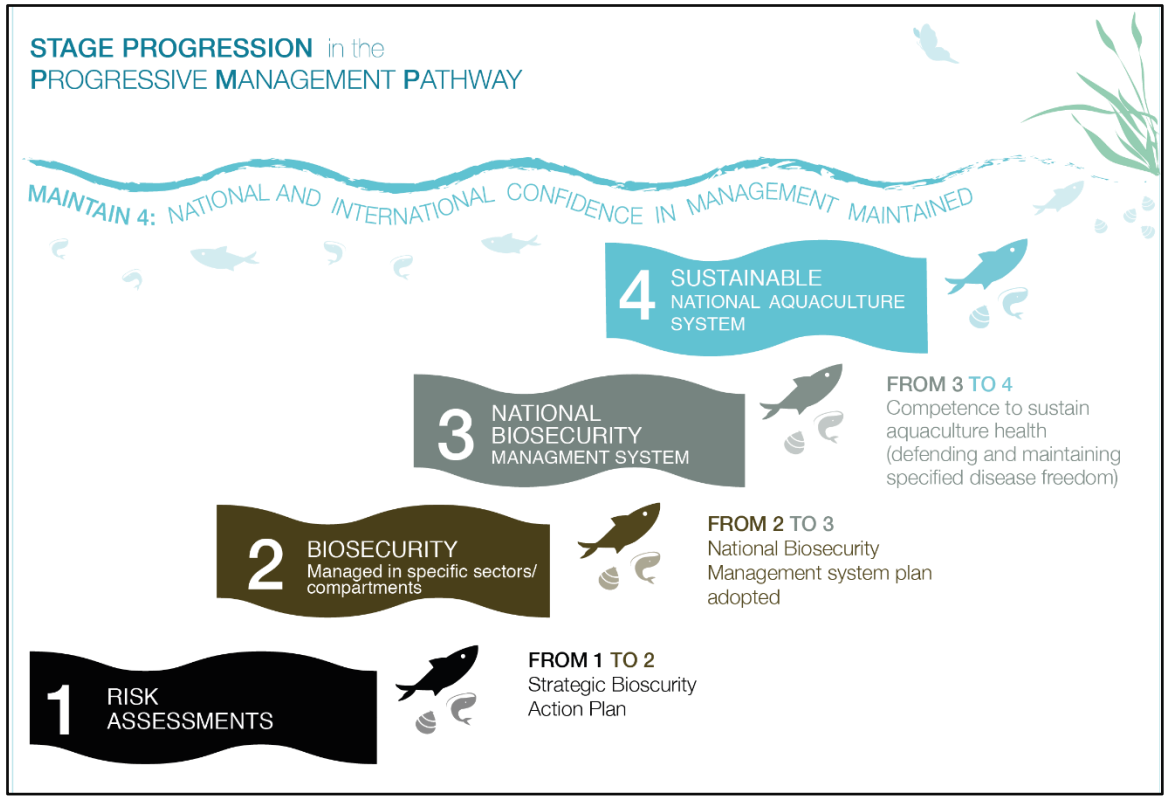

Development of PMP implementation plans should be developed between industry stakeholders and governance authorities to ensure buy-in, best-fit for country, but a template that provides a degree of consistency between participating countries or regions.

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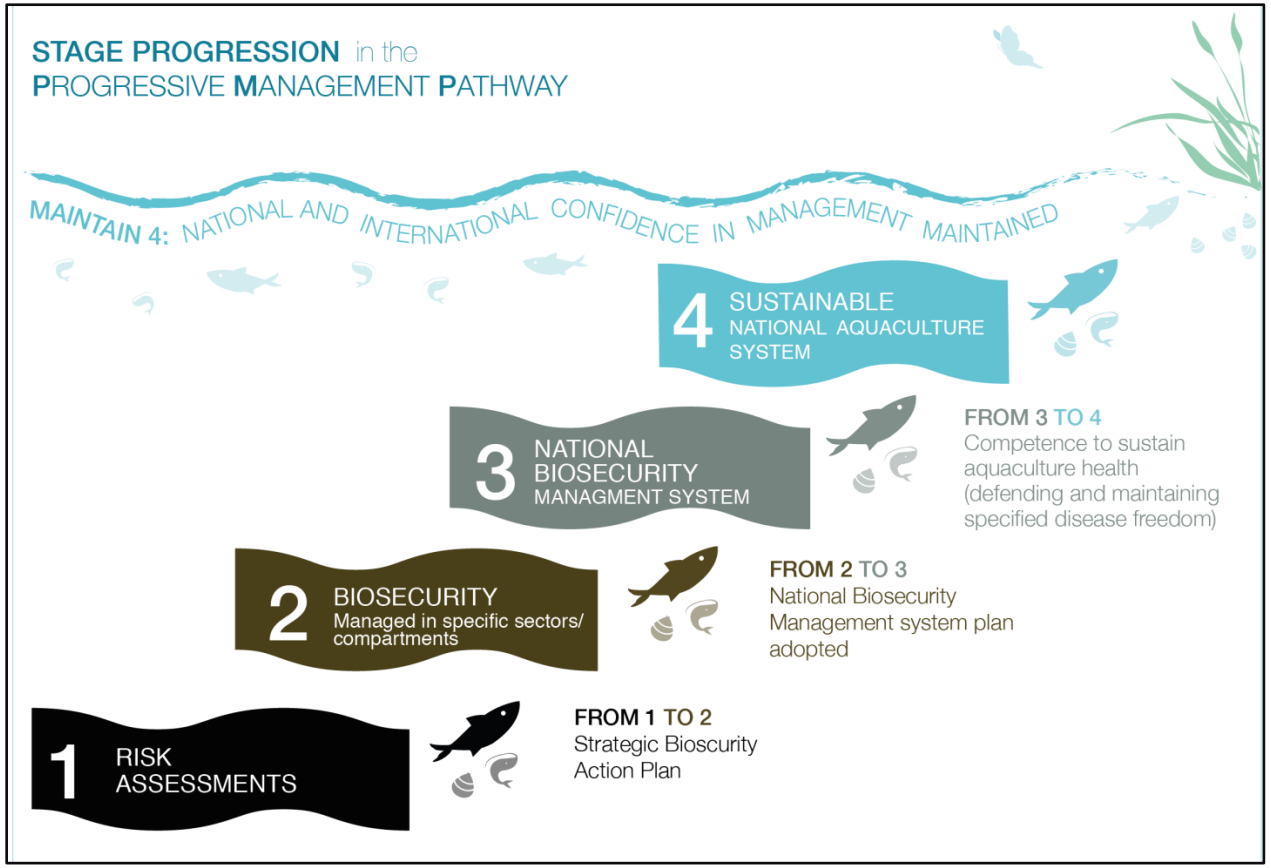
Stages can be considered as an elevator (including basement!) – you get on at your floor and stop at the floor which has the needs for your aquaculture industry – but everyone is in the same biosecure building, which will help global communication & share experiences as everyones' aquatic biosecurity progresses...



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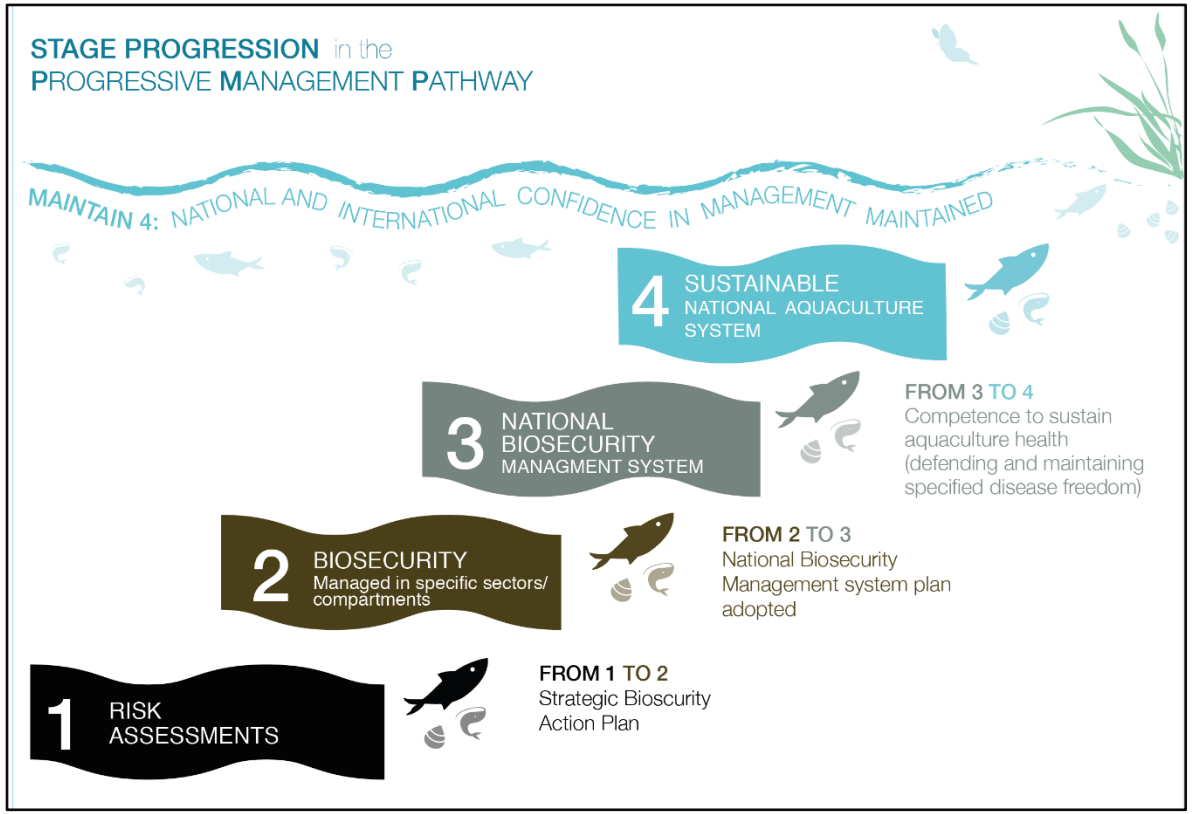
PMP provides an opportunity to help countries assess which stage they are at, research resource materials that can help, and provide confidence for a self-assessment start for biosecurity improvement towards a system that would be useful for outside assessment (PVS – for further improvement for veterinary services or aquatic animal competent authority for the country), and from there, if necessary, be prepared for 3rd party/trade partner audit.



Conclusions

- Strong complementarity with some countries established plans and aligned with progression towards international standards.
- Last, but not least, opens an essential opportunity to engage non-aquaculture stakeholders in aquaculture growth; i.e., fisheries and environmental/conservationists.
- Biosecurity progress at all levels is a good news story! Disease prevention is an aquaculture strength that benefits the sector itself, wild resources and environment.

❖ Needs further technical work to adapt the PMP FRAMEWORK to aquaculture (PMP-AB)!

Evidence Base

- Evidence base is inadequate!
- Business case! Marketing strategy!
- Knowledge on the socio-economic impacts of aquatic animal diseases must be improved!
- WB and FAO (and other interested partners) to explore opportunities!

Further Work

- Technical aspects of the PMP-AB FRAMEWORK
- Wider consensus building
- Initial application
- Resource mobilization

Further Work

- Technical aspects of the PMP-AB FRAMEWORK
  - Vision, goals and objectives
  - Sectoral approach
  - Indicators
  - Assessment criteria and procedure
  - Linkages with OIE
  - Second joint consultative workshop

Progressively we can improve biosecurity

Merci beaucoup