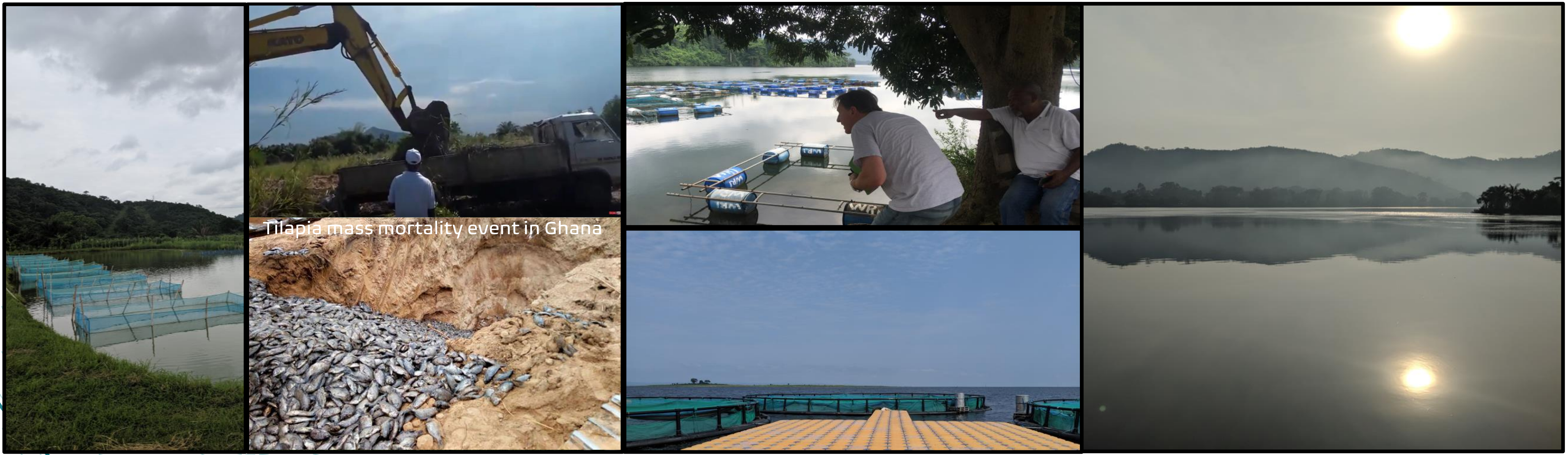
Aquatic Animal Health

OIE Collaborating Centre for Emerging Aquatic Animal Diseases

Cefas

The OIE Collaborating Centre for Emerging Aquatic Animal Diseases



Dr Richard Paley

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Emerging disease

An **emerging disease** is defined as a new infection resulting from the **evolution or change** of an **existing pathogen** or parasite resulting in a change of host range, vector, pathogenicity or strain; or the occurrence of a **previously unrecognized** infection or disease.

A **re-emerging disease** is considered an already known disease that either shifts its geographical setting or expands its host range, or significantly increases its prevalence.

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Aims

Rapid detection, characterization and reporting of the causative agents of [emerging] disease provide a crucial first step in their control. For this reason, efficient and accurate detection and description of **emergent and potentially emergent** aquatic animal disease threats forms the central precept of this OIE Collaborating Centre

We aim to function as a global resource for health and disease research, diagnostics, pathogen detection and description, and knowledge sharing, associated with aquatic animals

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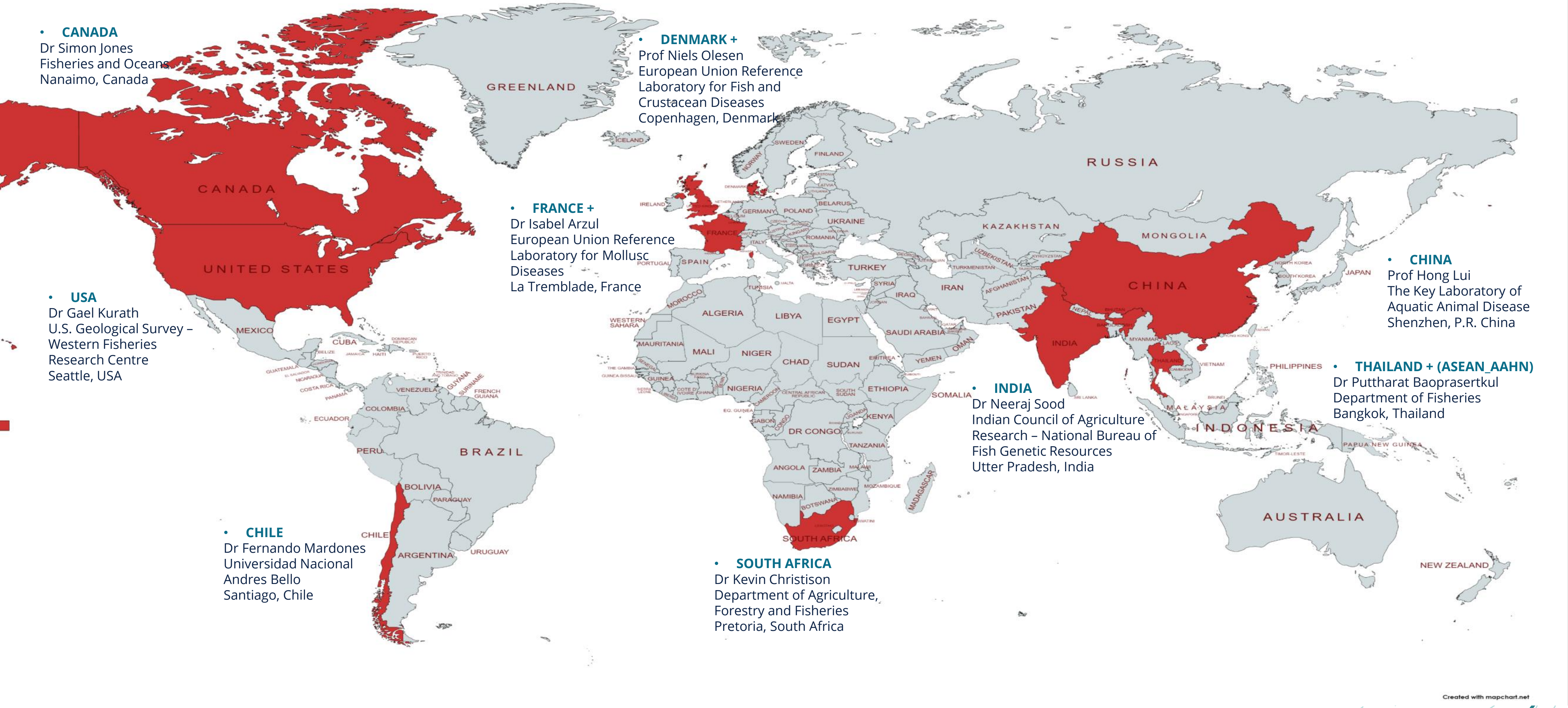
Key Functions

- Securing aquatic animal health, including identifying new and emerging disease conditions, reducing the transmission of diseases through risk management decisions based on prompt and effective scientific investigations.
- Ensuring transparency via dissemination of listed and emerging aquatic animal disease via the CCEAAD website, International Database on Aquatic Animal Diseases (IDAAD) and the Registry for Aquatic Pathology (RAP).
- Collecting, analysing and disseminating scientific information via the same mechanisms and directly to the OIE.
- Ensuring international solidarity through the ability to offer expertise to countries where aquaculture provides a critical food source threatened by disease occurrence.
- Promotion of diagnostic services through provision of training courses and workshops.
- Enhancing the capacity and sustainability of national diagnostic services to tackle emerging diseases in aquatic animals.

A Developing AAH Network



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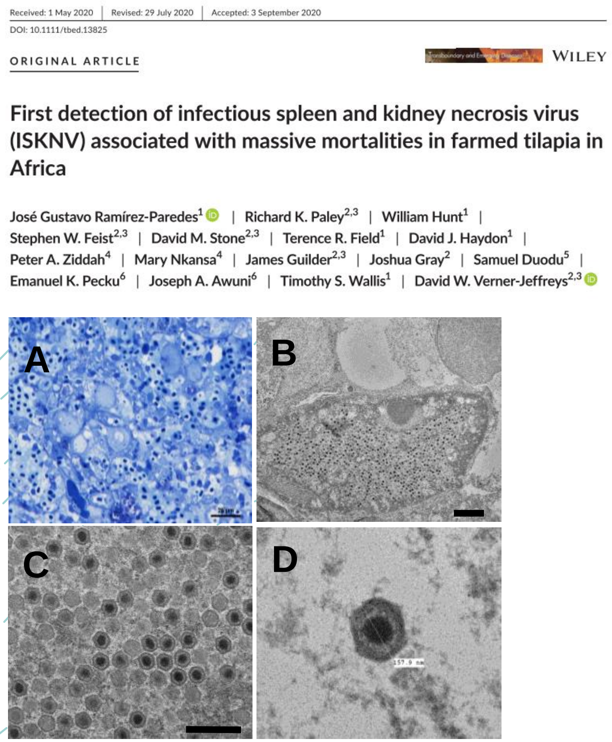
Rules of engagement

- Country approach led – e.g. request for assistance with disease investigation or capacity building
- Ensure national competent authorities aware and engaged
- Work with local associate laboratories, inc. EURLs and other OIE collaborating centres and reference laboratories.

Recent Projects

ISKNV in tilapia in Ghana


Received: 1 May 2020 | Revised: 29 July 2020 | Accepted: 3 September 2020
DOI: 10.1111/tbed.13825

ORIGINAL ARTICLE

WILEY

First detection of infectious spleen and kidney necrosis virus (ISKNV) associated with massive mortalities in farmed tilapia in Africa

José Gustavo Ramírez-Paredes[1] | Richard K. Paley[2,3] | William Hunt[1] | Stephen W. Feist[2,3] | David M. Stone[2,3] | Terence R. Field[1] | David J. Haydon[1] | Peter A. Ziddah[4] | Mary Nkansa[4] | James Guilder[2,3] | Joshua Gray[2] | Samuel Duodu[5] | Emanuel K. Pecku[6] | Joseph A. Awuni[6] | Timothy S. Wallis[1] | David W. Verner-Jeffreys[2,3]

Diagnostic technique training and support in country

Supporting PhDs - Epidemiology of ISKNV in lake Volta
- Novel detection methods

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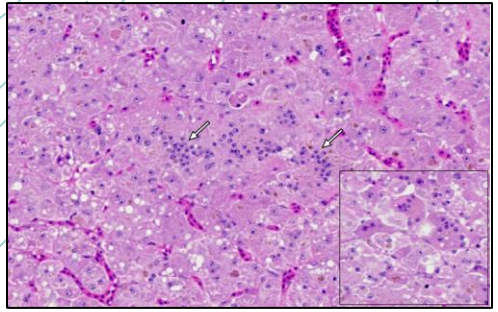
Recent Projects

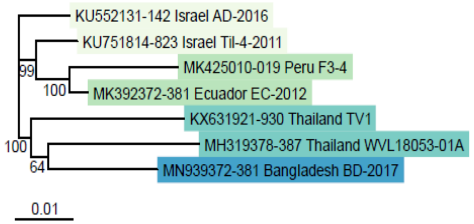
Variant TiLV in Bangladesh

Article

The Segment Matters: Probable Reassortment of Tilapia Lake Virus (TiLV) Complicates Phylogenetic Analysis and Inference of Geographical Origin of New Isolate from Bangladesh

Dominique L. Chaput [1,*], David Bass [2,3], Md. Mehedi Alam [4], Neaz Al Hasan [4], Grant D. Stentiford [2,3], Ronny van Aerle [2,3], Karen Moore [5], John P. Bignell [3], Mohammad Mahfujul Haque [4,†] and Charles R. Tyler [1,2,*,†]





Novel nidovirus in freshwater prawns

viruses MDPI

Article

A Novel RNA Virus, *Macrobrachium rosenbergii* Golda Virus (MrGV), Linked to Mass Mortalities of the Larval Giant Freshwater Prawn in Bangladesh

Chantelle Hooper [1,*], Partho P. Debnath [2,*], Sukumar Biswas [3], Ronny van Aerle [1,4], Kelly S. Bateman [1,4], Siddhawartha K. Basak [2], Muhammad M. Rahman [2], Chadag V. Mohan [5], H. M. Rakibul Islam [6], Stuart Ross [1], Grant D. Stentiford [1,4], David Currie [3] and David Bass [1,4,7]

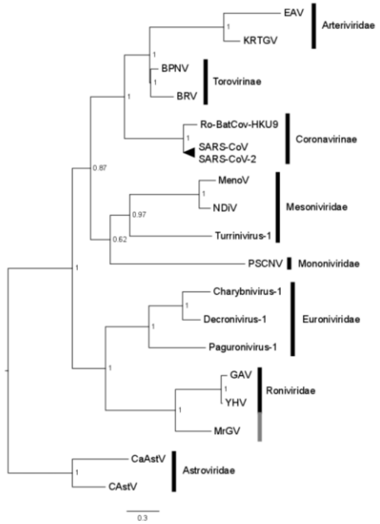
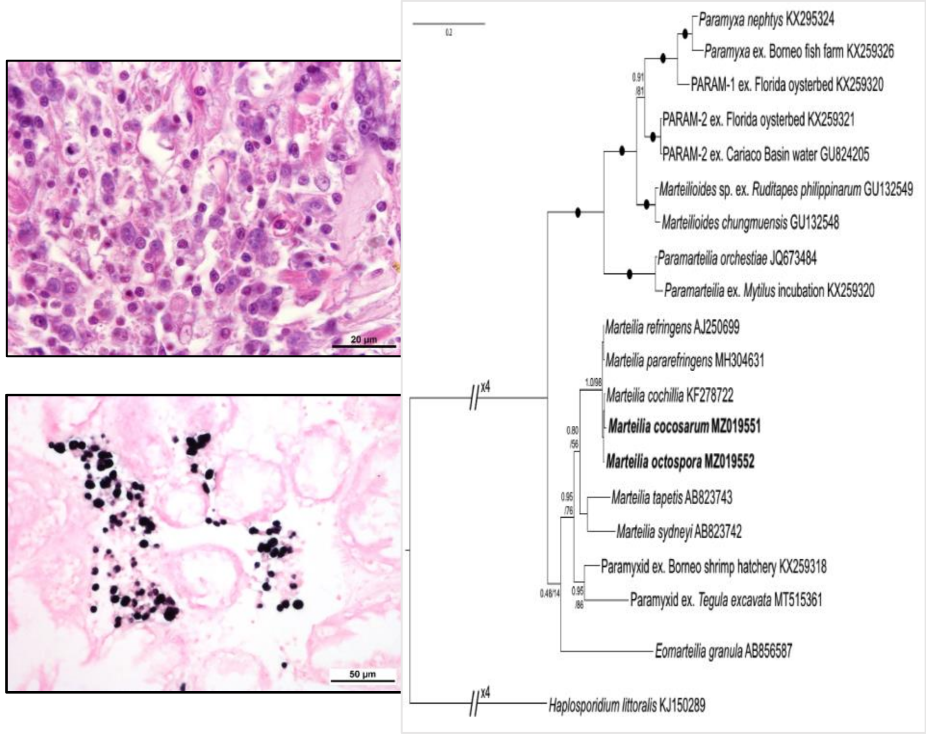


Figure 5. Bayesian consensus tree based on the RdRp of a representative set of nidoviruses, MrGV and astroviruses (outgroup). Accession numbers and names in Supplementary Table S2.

Marteilia cocosarum in Welsh cockles



ONE HEALTH AQUACULTURE

Africa Workshop

16th-17th March 2022

UK Government

nature food

PERSPECTIVE
https://doi.org/10.1038/s43016-020-0127-5

Check for updates

Cefas

Sustainable aquaculture through the One Health lens

G. D. Stentiford[1,2], I. J. Bateman[3], S. J. Hinchliffe[2,4], D. Bass[1,2], R. Hartnell[5], E. M. Santos[2,6], M. J. Devlin[7], S. W. Feist[1], N. G. H. Taylor[1,2], D. W. Verner-Jeffreys[1,2], R. van Aerle[1,2], E. J. Peeler[1,2], W. A. Higman[1], L. Smith[1], R. Baines[1], D. C. Behringer[8,9], I. Katsiadaki[1,2], H. E. Froehlich[10,11] and C. R. Tyler[2,6]

Aquaculture is predicted to supply the majority of aquatic dietary protein by 2050. For aquaculture to deliver significantly enhanced volumes of food in a sustainable manner, appropriate account needs to be taken of its impacts on environmental integrity, farmed organism health and welfare, and human health. Here, we explore increased aquaculture production through the One Health lens and define a set of success metrics — underpinned by evidence, policy and legislation — that must be embedded into aquaculture sustainability. We provide a framework for defining, monitoring and averting potential negative impacts of enhanced production — and consider interactions with land-based food systems. These metrics will inform national and international science and policy strategies to support improved aquatic food system design.

Support developing countries plan for sustainable aquaculture increase and prepare for negative impacts (such as disease outbreaks)

Define success metrics for sustainability

Inform international science and policy

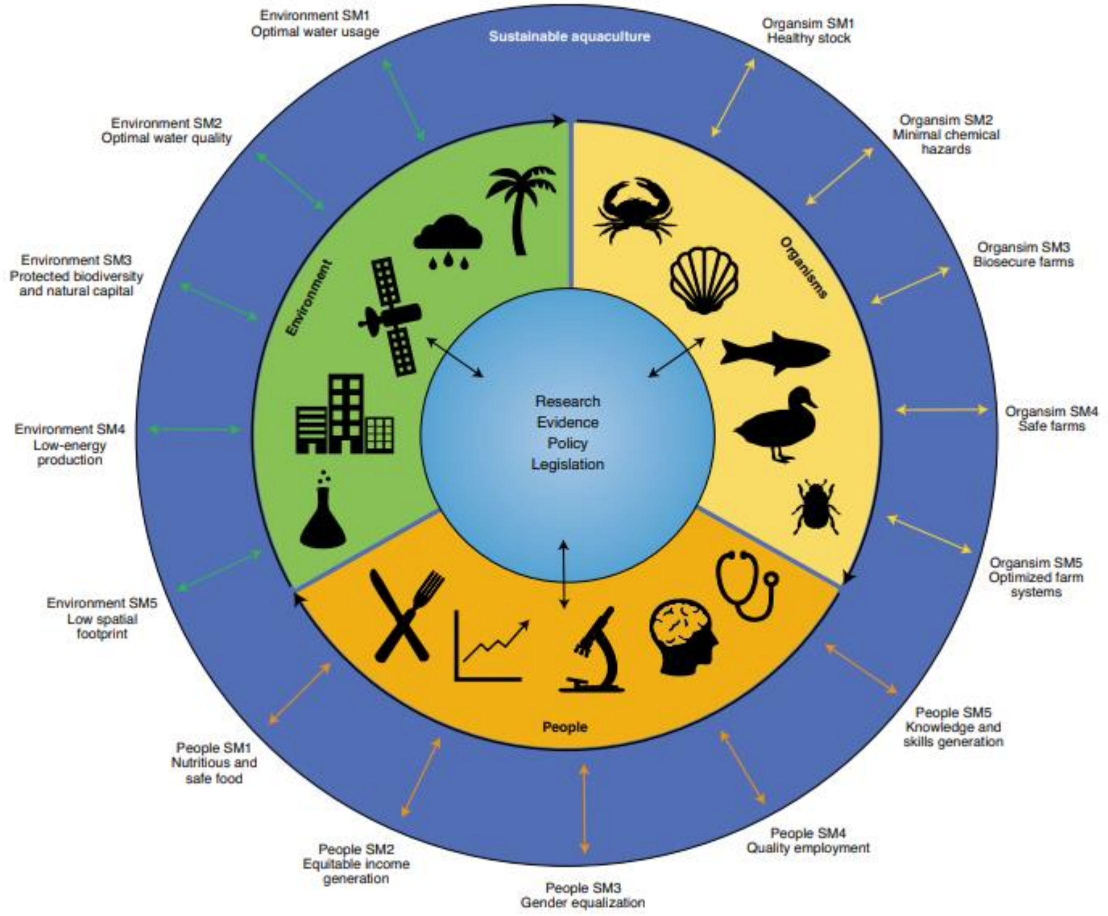


Fig. 2 | One Health success metrics for sustainable aquaculture. A One Health approach (Fig. 1) to the design and assessment of ESP in aquaculture and related sub-sectors requires success metrics (SMs) spanning environment, organism and human health. Descriptors for SMs (Table 1) are applied to hypothetical sub-sectors of the aquaculture industry in Fig. 3.

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nature food

ANALYSIS

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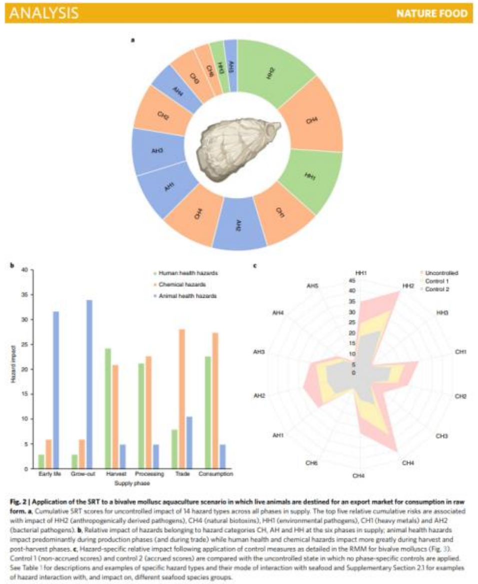
OPEN

A seafood risk tool for assessing and mitigating chemical and pathogen hazards in the aquaculture supply chain

G. D. Stentiford[1,2] ✉, E. J. Peeler[1,3], C. R. Tyler[2,4], L. K. Bickley[2,4], C. C. Holt[5], D. Bass[1,2], A. D. Turner[1,2], C. Baker-Austin[1,2], T. Ellis[1], J. A. Lowther[1], P. E. Posen[1], K. S. Bateman[1,2], D. W. Verner-Jeffreys[1,2], R. van Aerle[1,2], D. M. Stone[1], R. Paley[1], A. Trent[1], I. Katsiadaki[1,2], W. A. Higman[1], B. H. Maskrey[1], M. J. Devlin[6], B. P. Lyons[1], D. M. Hartnell[1], A. D. Younger[1], P. Bersuder[6], L. Warford[6], S. Losada[6], K. Clarke[6], C. Hynes[6], A. Dewar[6], B. Greenhill[6], M. Huk[6], J. Franks[6], F. Dal-Molin[6] and R. E. Hartnell[1] ✉

Intricate links between aquatic animals and their environment expose them to chemical and pathogenic hazards, which can disrupt seafood supply. Here we outline a risk schema for assessing potential impacts of chemical and microbial hazards on discrete subsectors of aquaculture—and control measures that may protect supply. As national governments develop strategies to achieve volumetric expansion in seafood production from aquaculture to meet increasing demand, we propose an urgent need for simultaneous focus on controlling those hazards that limit its production, harvesting, processing, trade and safe consumption. Policies aligning national and international water quality control measures for minimizing interaction with, and impact of, hazards on seafood supply will be critical as consumers increasingly rely on the aquaculture sector to supply safe, nutritious and healthy diets.

All hazards approach



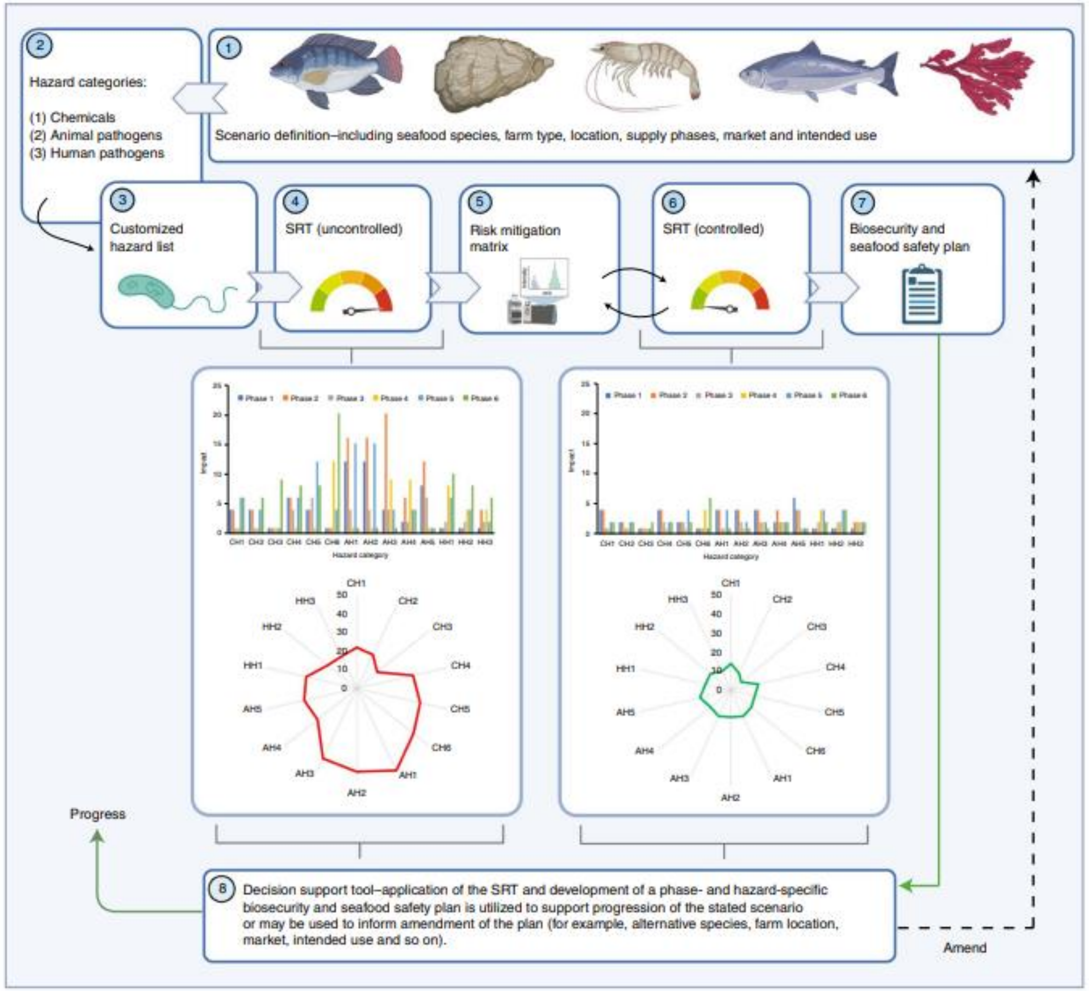


Fig. 1 | Application of the SRT to a specified aquaculture scenario. Stepwise progression requires a clear definition of the scenario to which the SRT is being applied (1) followed by the formation of a customized hazard list relating to the major CH, AH and HH hazard categories likely to interact with specific phases of supply (2 and 3). The SRT is initially applied to the uncontrolled state (4) where no mitigations are applied. By considering the role of phase-specific control options identified within the RMM (5), the SRT can be re-applied to this controlled state (6), repeating, if necessary, with different control combinations. The outturn is a biosecurity and seafood safety plan (7) that assists a decision to progress, amend or reject the aquaculture scenario in fulfilling its goal, as initially stated (8). CH1, heavy metals; CH2, persistent organic pollutants; CH3, radiological contaminants; CH4, natural biotoxins; CH5, veterinary, pharmaceutical and personal care chemicals; CH6, allergens; AH1, viral pathogens; AH2, bacterial pathogens; AH3, protistan pathogens; AH4, metazoan pathogens; AH5, syndromes; HH1, environmental pathogens; HH2, anthropogenically derived pathogens; HH3, zoonotic pathogens. See Table 1 for descriptions and examples of specific hazard types and their mode of interaction with seafood and Supplementary Section 2.1 for examples of hazard interaction with, and impact on, different seafood species groups. The spider diagram profiles represent the hypothetical risk profile when hazards are not controlled (red border) and when controls are applied (green border) throughout the supply chain for the scenario under consideration.

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Ongoing & New Projects, and Future aspirations

- Website, IDAAD revamp, information & protocol resources, Register of Aquatic Pathology

- Culture collections and support for PT schemes, rapid dissemination

- Uganda – supporting AAD diagnostics capacity development to investigate mortality events in Tilapia

- Uganda, Nigeria, Ghana – disease baseline status for Catfish



How to work with us

- Advice and protocols for sample collection, submission and shipping
- Advice and protocols for importation permits and fulfilment of Nagoya Protocols arrangements
- Advice for reporting collaboration and findings arising with national Responsible Authorities and OIE

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Thank You

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https://www.cefas.co.uk/icoe/aquatic-animal-health/designations/oie-collaborating-centre-for-emerging-aquatic-animal-disease/