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VIRTUAL COURSE

26 March to 15 April 2021

Design of an Active Surveillance for Tilapia Lake Virus (TILV) Disease and Its Implementation

TCP/INT/3707: Strengthening biosecurity (policy and farm level) governance to deal with Tilapia lake virus



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CHECKLIST 12

13 April 2021

Surveillance in the bigger picture

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TCP/INT/3707: Strengthening biosecurity (policy and farm level) governance to deal with Tilapia lake virus



Learning objectives

- To understand the requirements and criteria of checklist 12
- To recognize that surveillance provides the building blocks of information necessary to give an accurate picture of the distribution and occurrence of diseases relevant to disease control and international movement of aquatic organisms and their products



Learning objectives

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“When major health problems arise
someone must make decisions....
Good surveillance does not ensure
the making of the right decisions but
it reduces the chances of wrong ones”

(Alexander Langmuir, 1910 – 1993)
Creator of epidemiologic intelligence service



Translocation
of non-native
species

Liberalisation in
trade of animals
and products

Infectious
disease
control

Mass global
movement of
people





SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION 	14 LIFE BELOW WATER 	15 LIFE ON LAND 	16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	 SUSTAINABLE DEVELOPMENT GOALS

UN Sustainable Development Goals

- Of the 17 United Nations sustainable development goals (SDGs), addressing **biosecurity and health management in aquaculture** is more or less relevant to the most of the SDG (no poverty, zero hunger, good health and well-being, gender equality, decent work and economic growth, responsible production and consumption, climate action, life below water, and partnerships)
- **FAO**: in developing country food insecurity is endemic concern
- Vital step in expanding fish production is the **development of surveillance, diagnostic and professional services** to control fish diseases losses.



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Surveillance as transformative tool

- Unless aquatic disease control measures are integrated with other aspects of sustainable economic development, developing countries will have difficulty meeting the growing food demands or lifting small farmers from poverty.
- Aquatic disease surveillance is important not only to reduce disease cost, but has other national, regional and international benefits, so it should be a basement in achieving “bigger picture”.
- It is not only about understanding of health and welfare issues, but also the ways in which under the water world are vitally important to the economy and social structure of traditional farming communities.



Aquatic disease surveillance and One Health

The COVID 19 pandemic has reinforced the relevance of One Health principles in the global governance of infectious diseases, in particular in international efforts to prevent and contain zoonotic diseases (Ruckert et al, 2020).

One Health concept described in scientific literature 2005 in Lancet journal (Zinsstag et al.) highlighting need for prevention or reduction interaction between wildlife and livestock, so it forecasted future pandemic.

Further investigation has shown that there are substantial animal human interfaces in areas of poor health system performance highlighting those areas of potential impactful spillover where health infrastructure may be insufficient to identify spillover cases early and block onward human to human transmission (Walsh et al, 2020).

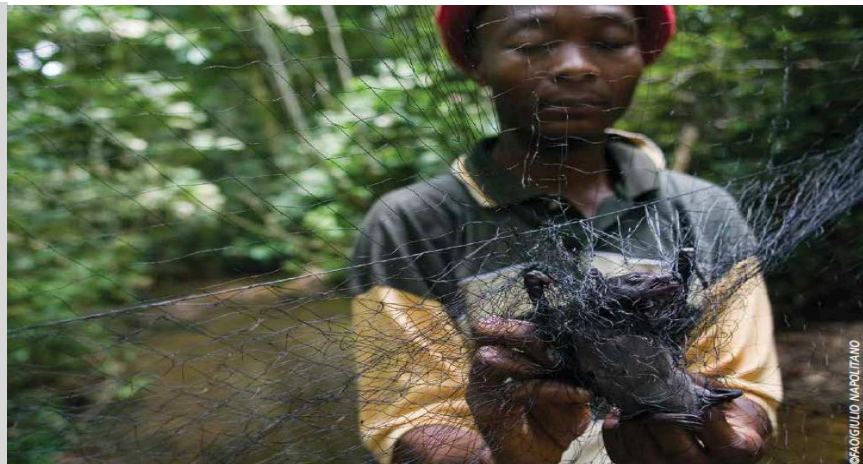


Box 1

One Health, as defined by the United States Centers for Disease Control

'One Health is a collaborative, multisectoral, and trans-disciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment'

Source: www.cdc.gov/onehealth/basics/index.html



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Box 2

One Health, as defined by the FAO–OIE– WHO Tripartite

'One Health is an approach to address a health threat at the human-animal-environment interface based on collaboration, communication, and coordination across all relevant sectors and disciplines with the ultimate goal of achieving optimal health outcomes for both people and animals; One Health is applicable at the subnational, national, regional, and global level'

Source: FAO–OIE–WHO (23)

Action required (research streams for effective implementation of One Health)

- To prevent future pandemic there is a pressing need to deepen the understanding of the interface or pathogen transmission between the environment, wildlife, domestic animals and humans as part of complex social – ecological system.
- Building integrated surveillance infrastructure (systematically collection of data) in order to secure early warning (integrated surveillance response, WB, 2012)
- However, current surveillance system still separated for animal, aquatic and human disease due to challenges of coordination and active collaboration between various agencies



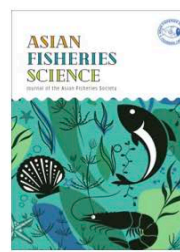
Action required (research streams for effective implementation of One Health)

- Effective response will require an adequate institutional landscape (regulations and policy) that facilitate a coordinated One Health governance
- At a local level, where direct interaction between humans, livestock, aquatic organisms and wildlife and other biodiversity component occur, One Health implementation require a transdisciplinary and cross sectoral collaboration with local community and stakeholders, to understand and mitigate environmental and epidemiological risks.
- Public engagement and specific focus on social sciences is strongly advised.



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Surveillance of aquatic disease and One Health



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ISSN: 0116-6514
E-ISSN: 2073-3720
<https://doi.org/10.33997/j.afs.2020.33.1.009>

Viewpoint: SARS-CoV-2 (The Cause of COVID-19 in Humans) is Not Known to Infect Aquatic Food Animals nor Contaminate Their Products

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Abstract

This paper was prepared in response to the need for clear communication regarding the risk of transmission of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes COVID-19 in humans and the general societal concern of potential contamination of aquatic animals used as food or their products with the virus. SARS-CoV-2 belongs to the family *Coronaviridae* and genus *Betacoronavirus*. Betacoronaviruses are only reported to infect mammals. Currently, there is no evidence to suggest that SARS-CoV-2 can infect aquatic food animals (e.g. finfish, crustaceans, molluscs, amphibians) and therefore these animals do not play an epidemiological role in spreading COVID-19 to humans. Aquatic food animals and their products, like any other surface, may potentially become contaminated with SARS-CoV-2, especially when handled by people who are infected with the virus. Nevertheless, with proper food handling and sanitation, the likelihood of contamination of aquatic animals or their products with SARS-CoV-2 should be negligible. The COVID-19 pandemic may indirectly affect livelihoods, food security and nutrition for populations that rely on aquatic animals as a source of food or income. However, COVID-19 outbreaks may also lead to an increase in local community consumption and/or utilisation of aquatic food animals or their products due to limited transportation and trade away from the fishing and harvesting communities or limited supplies of alternative sources of animal proteins.

Keywords: COVID-19, SARS-CoV-2, coronavirus, fish, aquatic food animals, public health



At local level

- Address directly first three SDG goals (poverty relief, food insecurity and good health)
- It will serve to reduce economic losses due to aquatic diseases
- It will support subsistence farming method
- It will enable growth of production and investments



At national level

- Surveillance is a key element of a national strategy on aquaculture biosecurity and aquatic animal health management and a fundamental element of any aquatic animal health protection programme (FAO 2007)
- Surveillance and monitoring programmes are essential for the early detection and rapid emergency response to significant disease outbreaks and form the basis for early warning of exotic incursions or newly emerging diseases (capacity building)
- It is also time to consider surveillance from a “One Health” perspective and, where possible, guide surveillance efforts to consider parameters of human and environmental health.
- However, focus of One Health should move closer to aquatic production (food security)



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Bosnia and Herzegovina



Draft national aquatic animal
health strategy for Bosnia and
Herzegovina

BOSNIA AND HERZEGOVINA
Ministry of Foreign Trade and Economic Relations
Veterinary Office of Bosnia and Herzegovina



Department
for Environment
Food & Rural Affairs

**England aquatic animal health strategy:
Rationale and next steps**

December 2015



At regional level

- Aquatic disease surveillance constantly develop due to specificity of aquatic world and ecological connection of wild and cultured fish through water environment that is by rules shared regionally (lack of independence)
- Surveillance programs and dissemination of results are also increasingly demanded by trading partners to support statements of national disease status and are the basis for disease zooning and compartmentalization



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FAO Fisheries and Aquaculture Report No. 906

FIMA/R906 (En)

ISSN 2070-6987

Report of the

**FAO WORKSHOP ON THE DEVELOPMENT OF AN AQUATIC
BIOSECURITY FRAMEWORK FOR SOUTHERN AFRICA**

Lilongwe, Malawi, 22–24 April 2008



NACA News



NACA Newsletter

ISSN 0115-8503

Published by the Network of Aquaculture Centres
in Asia-Pacific, Bangkok, Thailand

Volume XXXII, No. 1
January-March 2017

15th meeting of the Asia Regional Advisory Group on Aquatic Animal Health



The advisory group was established in 2001 to provide advice to member governments on aquatic animal health management. The activities of the group include evaluating disease trends and emerging threats in the region; identifying developments in global aquatic animal disease issues and standards of importance to the region; reviewing the regional aquatic animal disease reporting system and to provide guidance on strategies to improve aquatic animal health. The group is the linchpin of a regional network of experts, research centres and reference laboratories.

The 15th meeting was held from 21-23 November 2016, in Bangkok, Thailand. Members of the group include invited aquatic animal disease experts, representatives of the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO) and collaborating centres such as the SEAFDEC Aquaculture Department. Dr Melba Reantaso (FAO) was selected as the incoming chair, relieving Dr Kjersti Gravnningen (Aquaculture, Norway) who had served as Chair from 2014-2015. Highlights of discussions are summarised below.

Over the past year NACA had completed a project on development of a Code of Practice for the Trans-boundary Movement of Aquatic Organisms in the Lower Mekong Basin, for the Mekong River Commission. The code was developed in consultation with the fisheries line agencies of MRC member countries, with additional input via national surveys and a regional consultation workshop. The final draft of the code is available for download from the NACA website at: <http://enaca.org?id=38>.

FAO had initiated and progressed some technical cooperation projects on aquatic animal health. These included:

- Development of preventative aquatic animal health protection plan and enhancing emergency response capacities to shrimp disease outbreaks in Indonesia (new).
- Strengthening aquaculture biosecurity capacity of Malaysia's Department of Fisheries (new).
- Strengthening biosecurity capacity of Palau (new).

- Development of a national strategy for aquatic animal health, in the Federated States of Micronesia (new).
- Acute hepatopancreatic necrosis disease (ongoing), involving India, Iran, Philippines and Sri Lanka.
- Infectious myonecrosis virus (ongoing), involving China, Indonesia and Thailand.

FAO had also initiated several donor funded projects including on aquaculture certification (funded by the EU), antimicrobial resistance (funded by USAID) and on preparation of the Fiji National Aquatic Biosecurity and Aquatic Animal Health Strategy (funded by JICA).

The Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC/AQD) had conducted twelve in-house studies in 2016. These were aimed to i) investigate the efficacy of probiotics and rationalise use of diagnostics, ii) to promote the wider use of conventional and new diagnostic methodologies, iii) find safe and effective alternatives to use of drugs and chemicals in aquaculture and iv)



At international (global) level

- Needs to satisfy Sanitary and Phytosanitary agreement of World Trade Organisation
- Needs to follow international standards for disease reporting and notification
- Needs to satisfy requirements of international markets
- Needs to provide partnership for international donors and investments
- Needs to contribute to science



Challenges of our surveillance

Does the absence of detectable disease presence (TiLV) really mean the presence of disease absence?

To continue to document scientific justification of importance of aquatic disease surveillance in “One Health” (AMR, Food safety) and Food security

One Health collaboration

UNGA called upon the Tripartite (and other intergovernmental organizations), to support the development and implementation of national action plans and AMR activities at the national, regional and global levels



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Global leader for food and
agriculture



Global leader for animal health
and welfare standards



Global leader for human
health

A multi-partner trust fund (MPTF) to secure consistent and coordinated financing for a five-year period was established by the Tripartite, and administered by the United Nations Multi-Partner Trust Fund Office.

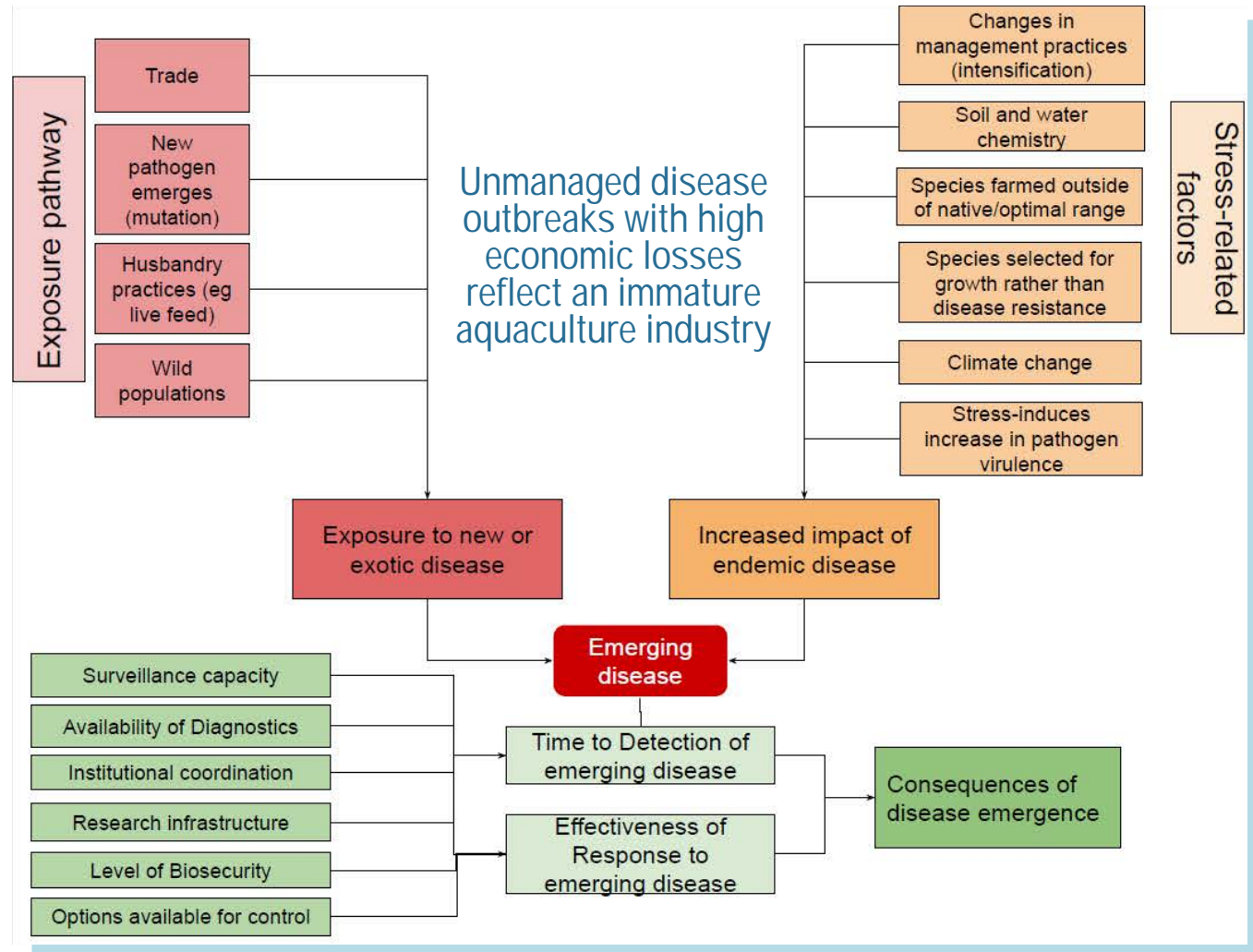
- 1) implementation of the NAP on AMR
- 2) awareness and behaviour change
- 3) **surveillance and monitoring of AMR and AMU**
- 4) stewardship and optimal use of antimicrobial agents
- 5) monitoring and evaluation

Recognized the need for UNEP to join this collaboration.



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Aquaculture Disease Emergence Causal Web





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

An extension of
the Progressive
Control Pathway
(PCP) for
livestock
diseases



Each stage has key
indicators and activities

**Risk assessment and
emergency preparedness**
always present at every
stage

Biosecurity action plans
serve as **gateway passes**
to move from one stage
to another

Key indicators and activities

Stage 1

- Value chain stakeholder mapping
- Risk analysis: threats and critical control points identified
- Enabling environment: Competent Authority identified, draft pathogen list, public-private PMP/AB taskforce, legislative review, aquatic health training, national laboratory
- National and sector-level risk-based biosecurity strategies

Stage 2

- Biosecurity measures implemented
- Monitor/assess effectiveness (audits & certification)
- **Surveillance** of endemic pathogens
- *Enabling environment: Lab capacity to support **surveillance**, AAHIS, legislation, national pathogen list adopted
- Biosecurity strategies revised and enhanced, e.g strong port/border controls, rapid detection and response

Stage 3

- Revised strategies and policies implemented
- Efficient, effective outbreak management
- Existing, exotic and emerging pathogens under **continuous surveillance**
- Disease incidence and impact reduced
- Enabling environment: Cost-benefit analysis, multi-agency taskforce, legislation for full implementation of strategies and enforcement of policies, lab capacity: rapid detection, emergency preparedness and response audit
- Commitment from public and private stakeholders to safeguard progress including investors

Stage 4

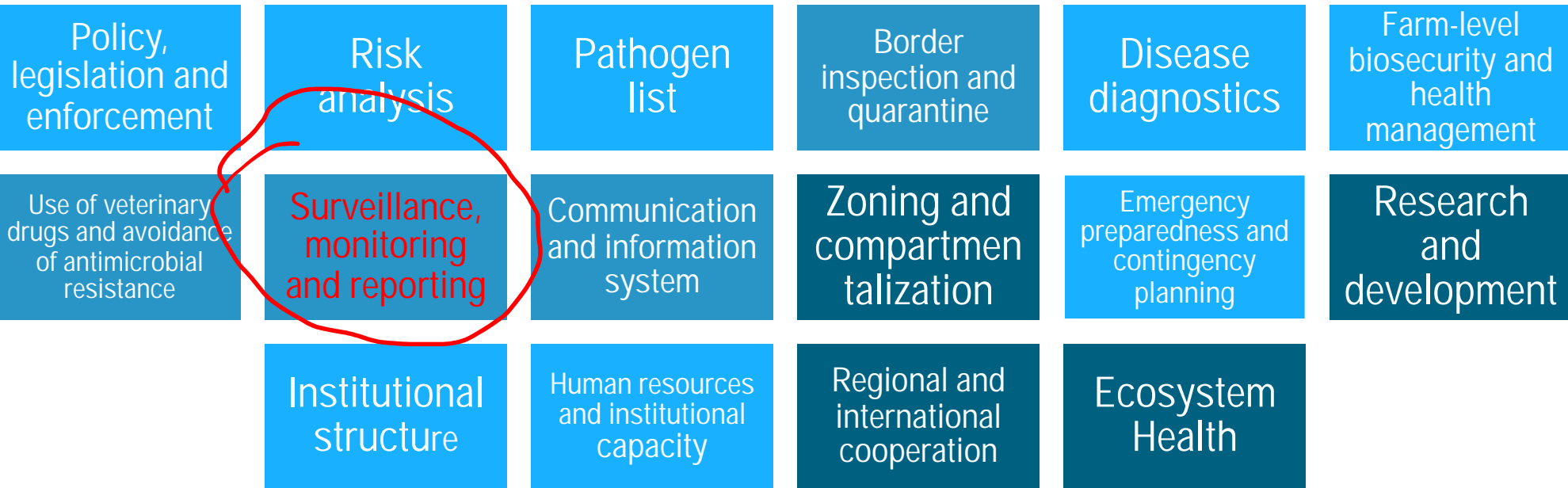
- Activities sustained & evidence-based improvement
- Enabling environment: Legislation reviewed and updated, zones compartments recognized by OIE (if applicable), support other countries in biosecurity development
- Robust socio-economic situation for all (incl. small-scale producers, food security)
- National & international stakeholders have confidence in the national aquaculture & ecosystem health
- safe trade and transparency

Surveillance is the systematic process of data collection, collation, analysis, and dissemination aimed at ascertaining the health status of a given population of aquatic animals. The information gained guides disease control activities and appropriate measures to prevent or stop disease spread.



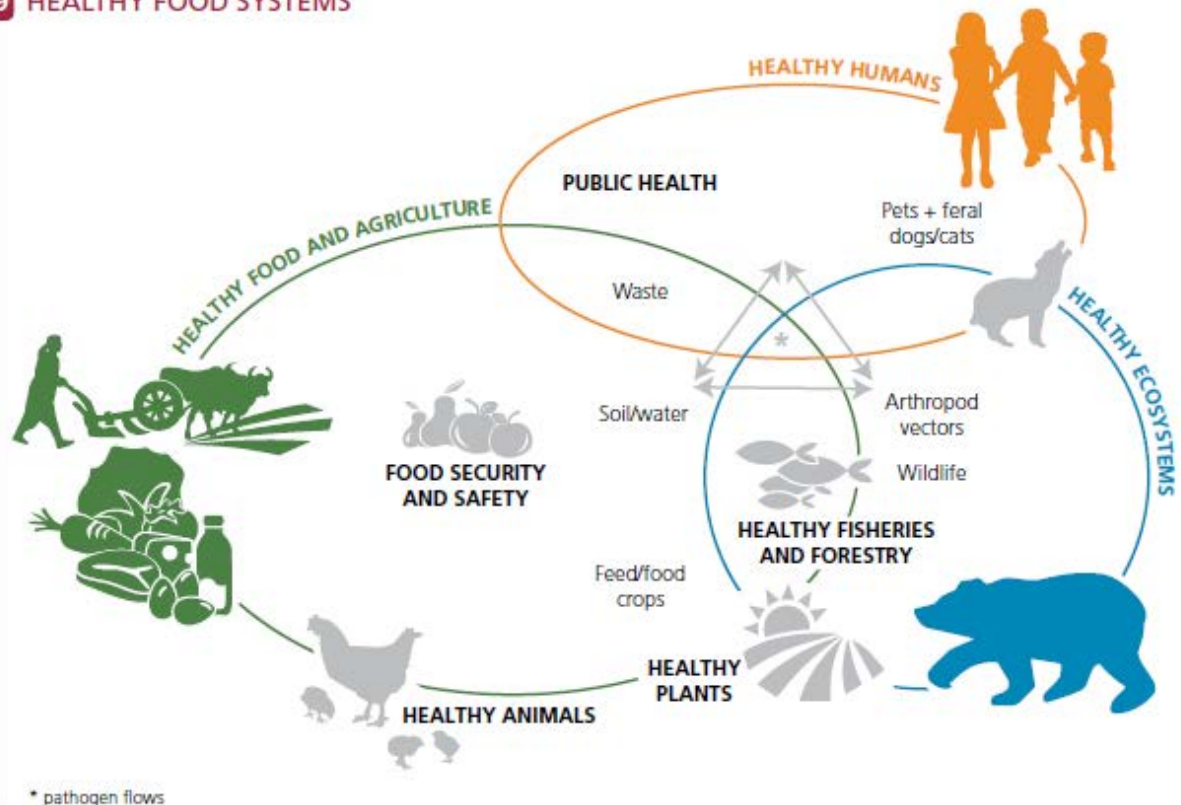
National Strategy on Aquatic Animal Health within the PMP/AB

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



● Stage 1 ● Stage 2 ● Stage 3

39 HEALTHY FOOD SYSTEMS



* pathogen flows



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Thank you for your attention!

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TCP/INT/3707:

Strengthening biosecurity
(policy and farm level) governance
to deal with Tilapia lake virus

This was also made possible with the support of the Norwegian Agency
for Development Cooperation under the project GCP/GLO/979/NOR
Improving Biosecurity Governance and Legal Framework for Efficient and
Sustainable Aquaculture Production.



Norad