

The FAO/NACA Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals: lessons learned from their development and implementation

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Summary

Aquaculture is the fastest growing food producing sector in the world and it is expected to produce significant quantities of fish in the coming years to meet the growing global demand for aquatic animal products. The expansion and diversification of the sector, along with globalisation and trade liberalisation have resulted in aquatic animals and animal products moving around the world rapidly, causing serious disease outbreaks stemming from incursions of pathogens through unregulated transboundary movements. It has become necessary to develop appropriate guidelines for establishing national regulatory frameworks to improve responsibility in transboundary movement of live aquatic animals. In 2000, the Food and Agriculture Organization of the United Nations (FAO), in collaboration with the Network of Aquaculture Centres in Asia-Pacific (NACA) and in partnership with 21 Asian countries, developed the Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals. The present article outlines the development process of the guidelines, the lessons learned from their implementation at national level and the way forward.

Keywords

Aquaculture – Aquatic animal – Aquatic animal health – Asia – Food and Agriculture Organization of the United Nations – Fish disease – Fish health – Guidelines – Transboundary disease – World Organisation for Animal Health.

Introduction

Global production from aquaculture has grown substantially, contributing in ever more significant quantities to the world's supply of aquatic food for human consumption. It now accounts for nearly 50% of the world's aquatic food. This increasing trend is projected to continue in forthcoming decades, with the vision that the sector will contribute more effectively to food security, poverty reduction and economic development by producing – with minimum impact on the environment

and maximum benefit to society – 83 million tonnes of aquatic food by 2030, an increase of 37.5 million tonnes over the 2004 level (12).

As aquaculture expands to new areas, it also intensifies and diversifies, and so does trade in aquaculture species, products and services. Through trade in aquaculture commodities, live animals or products, primary producers earn their livelihood and improve their economic well-being. Because trade is always associated with economic benefits, it is expected that it will continue – legally or illegally. On the other hand, trade in aquaculture

commodities has also been associated with the inherent risk of moving aquatic animal pathogens along with their hosts (12).

Ten years ago, in 1998, the Food and Agriculture Organization of the United Nations (FAO) launched a Technical Cooperation Programme (TCP) Project – TCP/RAS 6714 (A) and 9065 (A) – ‘Assistance for the Responsible Movement of Live Aquatic Animals’. This TCP was designed to address issues concerning transboundary pathogen transfer, with a view to building capacity in the Asia region for the responsible movement of live aquatic animals. It was implemented by the Network of Aquaculture Centres in Asia-Pacific (NACA), with the participation of 21 countries in Asia (Australia, Bangladesh, Cambodia, China, Hong Kong Special Administrative Region, India, Indonesia, Iran, Japan, the Republic of Korea, the Lao People’s Democratic Republic, Malaysia, Myanmar, Nepal, the Democratic People’s Republic of Korea, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand and Vietnam). The project created a strong Regional Aquatic Animal Health Programme which developed many ‘firsts’ in the field of aquatic animal health. For example, the following were established for the first time:

- regional and technical guidelines on health management for the responsible movement of live aquatic animals
- national strategies on aquatic animal health
- an internet-based aquatic animal pathogen and quarantine system
- a system for aquatic animal surveillance and quarterly reporting in Asia Pacific
- a series of capacity building exercises on risk analysis for aquatic animal movement, surveillance and reporting, and molluscan health management.

During the three-year period between 1998 and 2000, 12 national, 4 regional and 4 international events (training courses, workshops and consultations) were held. It was during this period of intense consultation between experts and government representatives that the Asia Regional Technical Guidelines for the Responsible Movement of Live Aquatic Animals in Asia or ‘Technical Guidelines’ were developed and elaborated (14). The Technical Guidelines have two companion documents, the Manual of Procedures (for its implementation) (15) and the Asia Diagnostic Guide to Aquatic Animal Diseases (8).

At the completion of project implementation in 2000 and the release of major project-related publications, NACA took on the task of further assisting participating governments in the development of national strategies and other capacity building exercises. Organisations and institutions such as the Asia-Pacific Economic Cooperation

(APEC), the World Organisation for Animal Health (OIE), the Australian Centre for International Agricultural Research (ACIAR), the Department for International Development of the United Kingdom and the Aquatic Animal Health Research Institute of Thailand’s Department of Fisheries worked in partnership with FAO and NACA to further develop the various thematic areas included in the Technical Guidelines.

The processes involved in the elaboration of the different elements of the Technical Guidelines, the current state of implementation, the lessons learned and the way forward are described in this paper.

Guiding principles and key elements of the Technical Guidelines

The Technical Guidelines contain a set of fifteen guiding principles pertaining to the movement of live aquatic animals, the role of health management, the scope of the health management process, the necessity of such measures being based on risk assessment, implementation of the guidelines (taking into account national capacities and relevant international treaties and agreements), harmonisation of procedures at regional level, transparent reporting, technical cooperation among experts, and collaboration among all stakeholders as regards the sharing of responsibilities and benefits.

The Technical Guidelines document is supplemented by a Manual of Procedures, which supports the implementation of the provisions given in the Guidelines.

The main elements included in the Technical Guidelines are:

- pathogens to be considered
- disease diagnosis
- health certification and quarantine
- disease zoning
- contingency planning
- import risk analysis
- institutional and capacity building requirements
- national strategies and policy frameworks
- regional capacity building
- implementation strategies.

The eighth point on this list, ‘national strategies and policy frameworks’, serves as the main framework for the national level implementation of the Technical Guidelines.

Global guidelines on health management for the responsible movement of live aquatic animals

The same guiding principles that are contained in the Asia Technical Guidelines can be found in the FAO Technical Guidelines for Responsible Fisheries, which were prepared to support sections of FAO's Code of Conduct for Responsible Fisheries (CCRF) (11). They address responsible fisheries management, aquaculture development, international trade and fisheries research. The global guidelines have expanded the perspective and considered strategies at national level and health management at the farm level as parallel measures (13). The global guidelines have two major components: i) national strategies on aquatic animal health and biosecurity and ii) farm-level health management and biosecurity programmes, the elements/components of which are listed below.

The national strategies on aquatic animal health and biosecurity contain the following elements:

- policy, legislation and enforcement
- risk analysis
- pathogen lists
- information systems
- health certification
- quarantine
- disease surveillance, monitoring and reporting
- zoning
- emergency preparedness
- research
- institutional structure
- human resources development
- regional and international cooperation.

The farm-level health management and biosecurity programmes contain the following elements:

- cluster management
- better management practices
- compliance with national legislation
- certification
- on-farm disease prevention
- surveillance and reporting of disease outbreaks

- emergency preparedness
- information sharing and farmer education.

Processes and progress in the implementation of the Technical Guidelines

Of the different elements included in the Technical Guidelines, progress has been made, to a greater or lesser extent, in the development and implementation of the following areas.

National strategies

The 'National Strategy on Aquatic Animal Health' of the Asia Technical Guidelines provides a framework for the implementation of the Guidelines at national level. It contains short, medium and long-term action plans to help governments implement the Guidelines, using the concept of 'phased implementation based on national needs'.

Varying processes have been involved in the development of national strategies. In some countries, take-off of a national strategy was immediate; in others, it was a slow process. The development of a national strategy is an ongoing process and builds on available resources for its implementation. In most cases, committees have been established to drive the process. It is up to governments to limit the scope of a national strategy. Mechanisms for monitoring its development and implementation are necessary and it must be incorporated into national aquaculture development plans (6).

The factors that are essential for the successful development and implementation of a national strategy include the following:

- strong national coordination
- good leadership to drive the process forward (through the Competent Authority, a commission, a committee, a task force, a focal person with clear terms of references)
- stakeholder consultation
- approval from the highest authority
- an implementation strategy
- monitoring and review
- a proposal development addressing the different elements
- funding and resource allocation.

Risk analysis for aquatic animal movement

In the past, decisions concerning aquatic animal movements were often made arbitrarily and in an *ad hoc* manner. In contrast, we now see good progress in countries that are taking steps to use the risk analysis approach as a decision-making tool. Starting from the initial work done by APEC, NACA and FAO in the Asia-Pacific region on building capacity on risk analysis (2), countries outside the Asian region (e.g. Latvia, Bosnia and Herzegovina, Belize, Pacific Island countries, Persian Gulf states, south African countries) also now recognise the importance of risk analysis procedures and are engaging in their own national initiatives (7). The experience gained in understanding and applying the risk analysis process as a decision-making tool for live aquatic animal movement has influenced the use of risk analysis in the field of aquaculture. The aquaculture sector is now considered to be *the* emerging agricultural sector, *the* catalyst of the 'blue revolution', *the* answer to the world's future fish supply, *the* fastest food-producing sector and *the* future of fisheries, so the industry has a real need for effective biosecurity programmes. Biosecurity measures are now being carefully considered in aquaculture (e.g. proactive disease risk analysis) to reduce the probability of a biological agent spreading, and to mitigate the adverse impacts that may result (18). Such biosecurity measures use the risk analysis framework that includes the best information available on husbandry, epidemiology and sound science.

Quarantine and health certification

Quarantine has often been thought of as simply a procedure applied to all imports of living aquatic animals. During the last 10 years, however, this thinking has changed considerably, with quarantine now increasingly viewed as a comprehensive process relating to both imports and exports, and including pre-border, border and post-border activities; it is now considered by national governments as one aspect of the 'National Aquatic Animal Health Strategy' within the risk analysis framework. Quarantine is considered to be an important risk mitigation measure, which, singly or in combination with other health management measures, can be effective in reducing disease risk. Health certification is an important and integral component of the quarantine process and a prerequisite for international movement of live aquatic animals. Aquatic animal quarantine guidelines, in support of the implementation of the FAO Code of Conduct for Responsible Fisheries, have been developed with the experience gained, particularly through the implementation of the Technical Guidelines in Asia (3).

Disease surveillance and reporting

The regional surveillance and reporting mechanism for aquatic animal diseases established in Asia in 1998, the

first of its kind, has gone a long way in providing a more accurate picture of the disease situation in the region (16).

The concepts of epidemiology and surveillance have been fully integrated into aquatic animal health management in Asia and the Pacific since 1996, when ACIAR organised a 'Master Class on Aquatic Epidemiology' for a select group of senior aquatic animal health specialists in the region. Not only are countries implementing surveillance (targeted and passive) as part of the quarterly aquatic animal disease reporting system, but countries also enforce active surveillance for emerging diseases immediately following outbreaks in trading or neighbouring countries.

The required technical guidance is provided on aquatic disease diagnostics (8), surveillance and zoning (19).

Emergency response to disease epizootics

There are many examples of the devastating impacts that aquatic animal disease outbreaks can have on the livelihoods of aquafarmers, for example:

- outbreaks of epizootic ulcerative syndrome (EUS) in freshwater and brackishwater fish in Asia (during the 1980s and the 1990s)
- outbreaks of viral encephalopathy and retinopathy in marine fish in Asia (ongoing since the 1990s)
- outbreaks of white spot syndrome virus (WSSV) and Taura syndrome virus in penaeid shrimp in Asia and Latin America (ongoing since the early 1990s).

International emergency aquatic disease investigation task forces investigated the koi herpes virus (KHV) epizootic in Indonesia in 2002 and the most recent outbreak of EUS in the Chobe-Zambezi river system affecting Botswana and Namibia in 2007. These investigations demonstrated that a rapid and timely response can reduce potential catastrophic consequences of disease incursions. The task forces did not prevent either disease from spreading; however, the emergency response resulted in creating a strong awareness of the importance of early detection and rapid response to aquatic animal epizootics both at national and regional levels. It also facilitated the provision of emergency support to affected countries to build capacity and enhance exchange of information between trading partners. Needless to say, such responses are *ad hoc* in nature, and a more permanent framework for dealing with emergencies should be established at the regional level through an appropriately-mandated institution; such a framework should ensure that the necessary funding and a pool of different experts are made available.

Lessons learned in these emergency responses revealed the importance of the following:

- regional and international cooperation to deal with transboundary aquatic animal diseases
- national strategies and contingency plans
- increased awareness of emerging epizootics in other regions
- improved compliance with treaties and agreements
- improved diagnostics
- emergency preparedness as a core government function
- proactive surveillance and reporting of diseases
- advanced financial planning for disease emergencies (10).

The work of FAO, in collaboration with NACA and the OIE, led to the development of guidelines on preparedness and response to aquatic emergencies in Asia (1). The approach taken in the development of these guidelines followed that of Baldock (2005) (5) (see Figure 1) and is consistent with the OIE *Aquatic Animal Health Code* and the FAO Good Emergency Management Practices programme. As previously mentioned, contingency planning within the national strategy framework has a paramount role to play in preventing the entry of exotic pathogens and in detecting, containing and if possible, eradicating serious pathogens if they appear in susceptible species within a national territory or shared water body. Dealing with disease emergencies involves a great deal of planning and training as well as an appropriate and sufficient level of resources (e.g. skilled personnel, equipment, finances, legislation, etc.).

The objective of the FAO guidelines on preparedness and response to aquatic animal health emergencies in Asia is to provide detailed technical advice to assist Competent Authorities and other responsible individuals in dealing

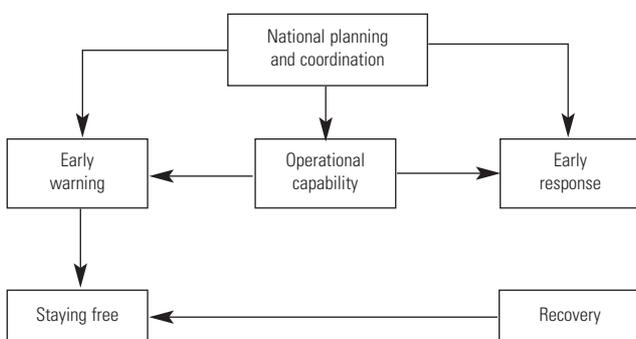


Fig. 1
Framework for emergency disease preparedness and response
 (5)

with aquatic disease emergencies through better planning and response and the preparation of national or bi-, and/or multi-lateral contingency plans, as appropriate. The guidelines contain the following chapters:

- (i) national planning and coordination
- (ii) operational capability (composed of responsibility for aquatic animal disease emergencies, aquatic animal disease contingency planning as a component of a National Disaster Plan, and legislation and enforcement)
- (iii) early warning
- (iv) early detection
- (v) risk analysis
- (vi) disease surveillance
- (vii) early response
- (viii) contingency plans
- (ix) recovery from an emergency disease
- (x) staying free.

Prior to the development of these guidelines, FAO, in partnership with NACA, the WorldFish Center and the Government of Indonesia (through the Ministry of Marine Affairs and Fisheries), jointly organised a Regional Workshop on Preparedness and Response to Aquatic Animal Health Emergencies in Asia in September 2004 in Jakarta, Indonesia. The regional workshop provided a platform for developing and developed countries to share experiences of managing aquatic animal disease emergencies and for the FAO and the OIE to talk about their experiences of dealing with disease emergencies in the livestock sector. The workshop strongly recommended the following:

- at the national level, the number of emergency response staff should be increased, the skills and awareness of personnel at producer, disease-support and decision-making levels should be strengthened, and adequate resources should be allocated to support the implementation of emergency response strategies
- at the regional level, existing disease reporting systems should be further strengthened to ensure increased sharing of information on emerging aquatic animal diseases of significance to Asia and the national aquatic animal disease status of countries in the region
- regional support mechanisms should be used to provide expert teams and information to countries in order to assist in early response to disease problems
- research to support early warning and early response should focus on rapid diagnostics, epidemiology, risk assessments and biosecurity

- detailed *post-mortem* analyses of the outbreaks of KHV in Japan and Indonesia should be conducted to understand the actions taken, the extent of their success and the lessons learned

- core funding should be allocated at national and regional levels to provide early resources to respond rapidly to emergencies (17).

In order to reduce the risks of transboundary aquatic disease epizootics, effective prevention and control measures should be complemented with improved diagnostic and extension services, educational programmes and other capacity building activities for farmers and other seafood producers. It is important to ensure that operational capability at the national level is in place to respond effectively to disease emergencies, and that such a national approach is supported by a well-planned regional strategy.

It is also important to emphasise the benefits that can be gained from investing and participating just as much in emergency response systems for aquatic diseases as in those systems dealing with terrestrial animal and human diseases.

Regional and international cooperation

Regional and international cooperation is of paramount importance in dealing with transboundary aquatic animal diseases. The last two decades have shown the positive impact of regional and international cooperation, how building on each other's strength rather than competing and duplicating work can lead to more efficient use of scarce resources. There is now more open communication, not only between countries affected by similar diseases, but also between countries that are still fortunate to be protected from those diseases. Health management has become a strong and valid entry point for regional and international cooperation.

Conclusions and the way forward

The development of the Technical Guidelines took advantage of the following:

- an FAO regional Technical Cooperation Programme, which paved the way for the development of the guidelines
- technical support services and expert consultations, which helped to provide a solid understanding of the general principles and the essential elements which the guidelines eventually comprised
- cooperation from member governments that participated through nominated national coordinators for aquatic animal health and served as the vital link in the

development of national strategies and initiation or implementation of the various provisions of the guidelines

- various national projects and/or donor-supported activities which assisted, to a greater or lesser extent, in monitoring the implementation aspects of the guidelines; such activities provided information on which elements worked well at the ground level (and those that did not) and highlighted the gaps

- strong collaboration with partner organisations with similar interests, which has in many ways helped to increase understanding and also to implement the guidelines

- a supporting implementation strategy that used the concept of 'phased implementation based on national needs', which provided the impetus for many years of continuous and progressive work on various aspects of aquatic animal health management.

It will probably still take a long while before the long-term impact of the various initiatives can be discerned. However, because of the numerous direct and indirect consequences of failing to prevent disease incursions, many stakeholders, including governments, are now cautious and cognizant of the importance of taking proactive biosecurity measures. The economic impact of aquatic animal diseases is very much a grey area in the literature and no systematic economic assessment has been carried out so far. However, due to the frequency of occurrence and the magnitude of spread and effects, many countries are now providing estimates of disease impacts, which are expressed in monetary estimates, percentage decrease in production, export losses, unemployment, closure of aquaculture operations and loss of consumer confidence. Estimates of economic impacts in terms of the cost of investment in disease research and other health management programmes as well as economic investments (e.g. development of national strategies, setting up of research institutes, operating costs for a reference laboratory, funding research and disease control programmes and investments in development programmes) are also available. Systematic assessments of the socio-economic impacts of aquatic diseases and cost-benefit analyses of disease prevention programmes should be pursued to gain attention and to generate support from both the public and private sectors (9).

The development and implementation of national strategies on aquatic animal health within broader national aquaculture development plans and biosecurity frameworks should be continuously pursued. The national strategy should be comprehensive and should provide a good entry point for capacity building for many countries, at whatever level of national economic development they may currently be. The focus should be on prevention, responsible and better health management practices and ensuring and maintaining healthy aquatic production.



Lignes directrices techniques régionales FAO/NACA pour la gestion sanitaire et les déplacements responsables des animaux aquatiques en Asie : les leçons de leur élaboration et de leur mise en œuvre

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Résumé

De tous les sous-secteurs de l'industrie agro-alimentaire, l'aquaculture est celui qui connaît la croissance la plus rapide ; il lui faudra produire dans les années qui viennent suffisamment de poisson pour satisfaire une demande mondiale en constante augmentation. Cette expansion et diversification du secteur, auxquelles s'ajoutent la mondialisation et la libéralisation des échanges ont pour conséquence une accélération de la mobilité des animaux aquatiques et de leurs produits dans le monde, qui entraîne de nouveaux foyers graves de maladie suite aux incursions d'agents pathogènes lors de déplacements transfrontaliers non réglementés. Il est désormais impératif de développer des lignes directrices établissant des cadres réglementaires nationaux afin de renforcer les responsabilités en matière de déplacements transfrontaliers des animaux aquatiques vivants. En 2000, l'Organisation des Nations unies pour l'alimentation et l'agriculture (FAO) a préparé des Lignes directrices techniques régionales sur la gestion sanitaire et les déplacements responsables des animaux aquatiques vivants, avec le soutien du réseau des centres d'aquaculture de la région Asie-Pacifique (NACA) et en partenariat avec 21 pays asiatiques. Après avoir rappelé le processus d'élaboration de ces lignes directrices, les auteurs tirent les leçons de leur mise en œuvre dans différents pays et tracent quelques pistes pour l'avenir.

Mots-clés

Animal aquatique – Aquaculture – Asie – Ligne directrice – Maladie des poissons – Maladie transfrontalière – Organisation des Nations unies pour l'alimentation et l'agriculture – Organisation mondiale de la santé animale – Santé des animaux aquatiques – Santé des poissons.



Enseñanzas extraídas de la elaboración y aplicación de las directrices regionales de la FAO/NACA relativas a la gestión sanitaria para un movimiento responsable de animales acuáticos vivos en Asia

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Resumen

La acuicultura es el sector de producción alimentaria que crece con mayor rapidez en todo el mundo. Se prevé que en los años venideros producirá importantes cantidades de pescado, que sirvan para satisfacer la creciente

demanda mundial de productos procedentes de animales acuáticos. Los animales acuáticos y sus derivados circulan con gran rapidez por todo el planeta a resultas de la expansión y diversificación del sector, sumadas a la mundialización y la liberalización del comercio. Ello, a su vez, ha provocado episodios de penetración de patógenos a consecuencia de desplazamientos transfronterizos no regulados, lo que ha dado lugar a graves brotes infecciosos. Ahora es indispensable elaborar pautas adecuadas para establecer en cada país marcos reglamentarios que mejoren el nivel de responsabilidad en el movimiento transfronterizo de animales acuáticos vivos. En 2000, la Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO), en colaboración con la Red de Centros de Acuicultura de Asia-Pacífico (NACA) y en asociación con 21 países asiáticos, elaboró las "Directrices regionales de Asia sobre gestión sanitaria para un movimiento responsable de animales acuáticos vivos". Los autores examinan sobre todo el proceso de elaboración de esas directrices, las lecciones extraídas de su aplicación en cada país y el rumbo que conviene seguir en el futuro.

Palabras clave

Acuicultura – Animal acuático – Asia – Directrices – Enfermedad de los peces – Enfermedad transfronteriza – Organización Mundial de Sanidad Animal – Organización de las Naciones Unidas para la Agricultura y la Alimentación – Salud de los animales acuáticos – Salud de los peces.



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