Perspectives on aquatic animal disease contingency planning in the Asia-Pacific region

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Summary
The movement of live aquatic animals is one of the principal reasons for the rising number of disease emergencies in Asia and the Pacific. Contingency planning is crucial in the effective management of such emergencies. Within Asia, the Asia Regional Technical Guidelines on Health Management and the Responsible Movement of Live Aquatic Animals provide the basic framework for national and regional efforts to reduce the risk of introducing disease across borders. However, in following these guidelines, the progress made by countries on contingency planning has, to date, been rather limited. In this paper, the authors broadly examine the implementation of health management programmes, highlight some regional initiatives that support contingency planning and describe the present status of contingency planning in the Asia-Pacific region.

Keywords

Introduction
The Asian region leads the world in aquaculture, contributing over 85% of global aquaculture production by volume (6). Ensuring the sustainability of the sector and safeguarding the interests of small-scale farmers are crucial objectives for national governments in the region. Aquaculture is expanding, intensifying and diversifying at a phenomenal pace, but this comes at great cost. The environmental, social and financial sustainability of the sector is increasingly becoming the focus of attention. The aquaculture sector must actively respond to these concerns. It needs to increase overall efficiency to comply with global trade requirements, such as food safety, traceability and certification, and – at the same time – remain competitive and profitable. This is not easy, especially for the millions of small-scale farmers involved in aquaculture all over Asia.

Aquatic animal health is one of the major hurdles facing the sector. The devastating impact of such diseases as epizootic ulcerative syndrome and koi herpessvirus (KHV) in fish; white spot disease (WSD) and Taura syndrome (TS) in shrimp; and abalone viral mortality in molluscs has been well demonstrated. Countries must develop and implement effective national aquatic animal health strategies if they wish to address health issues effectively and support the development of sustainable aquaculture. Such national strategies must be simple, practical and able
to be implemented with whatever national resources are available (e.g. trained personnel, existing institutions and available funds). These national strategies should consider not only disease management at the farm level, but also:

- transboundary pathogens
- the misuse of chemicals under the guise of ‘health management’
- the food safety concerns of consumers (domestic and international)
- compliance with regional and international agreements and standards, for example, the World Organisation for Animal Health (OIE) aquatic animal health standards (16), the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (17), and the Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries (5).

Aquatic animal
disease emergencies in Asia and the Pacific

A disease emergency occurs when a population of aquatic animals is recognised as experiencing severe mortality, or there is some other emerging disease threat where urgent action is required. Infectious disease emergencies may arise in a number of ways, for example:

- the introduction of known exotic diseases
- sudden changes in the pattern of existing endemic diseases
- the appearance of previously unrecognised diseases (3).

Disease emergencies caused by transboundary pathogens pose serious threats to aquaculture in many parts of the Asia-Pacific region. The movement of live aquatic animals across borders is one of the principal reasons for the increased occurrence and spread of several serious diseases in the region (4, 8, 14). Emerging aquatic animal diseases and their spread across national and international boundaries are recognised as threats to the sustainability of the aquaculture sector in the Asia-Pacific region.

Contingency planning, early warning and early response are vital to the effective management of such disease emergencies. Table I lists the occurrence of important transboundary aquatic animal diseases, based on information recorded in 36 issues (1998 to 2007) of the Network of Aquaculture Centres in Asia-Pacific (NACA)/FAO/OIE Quarterly Aquatic Animal Disease (Asia-Pacific Region) reporting system (QAAD). All 36 QAAD reports are available at www.enaca.org/health. Twenty-one countries participate in this regional reporting system, which generates information on important diseases in the Asia-Pacific region and also provides an early warning system for emerging pathogens, such as KHV, TS virus (TSV), Macrobrachium rosenbergii noda (MrN) virus and infectious myonecrosis virus. Careful examination of the history and spread of these transboundary diseases indicates how the lack of effective quarantine and surveillance systems and contingency plans can have a grave impact on aquaculture and wild fisheries resources.

Regional guidelines

In the year 2000, 21 governments in the Asian region adopted the guiding principles of the ‘Asia Regional Technical Guidelines on Health Management and the Responsible Movement of Live Aquatic Animals’ (or the ‘Technical Guidelines’) and their associated implementation plan, The Beijing Consensus and Implementation Strategy (BCIS) (7), as a regional strategy. Within Asia, the Technical Guidelines provide the basic framework for national and regional efforts in reducing the risk of disease due to transboundary movements of live aquatic animals. The main elements of the Technical Guidelines are:

- guiding principles
- pathogens to be considered
- disease diagnosis
- health certification and quarantine measures
- disease zoning
- disease surveillance and reporting
- contingency planning
- import risk analysis
- national strategies and policy frameworks
- regional capacity building
- an implementation strategy.

This is a comprehensive framework that includes all major requirements for managing aquatic animal disease emergencies.

The various countries in the region are at different stages of developing the national aquatic animal health strategies that contain the action plans of their governments. Despite considerable progress, there are still areas that need more commitment from national governments. An assessment of the progress made in the Asia-Pacific region in implementing the various elements contained in the Technical Guidelines is provided in Table II.
Table I
The occurrence of important finfish and crustacean transboundary diseases in Asia and the Pacific
These data are as reported by countries through the Network of Aquaculture Centres in Asia-Pacific/Food and Agriculture Organization/World Organisation for Animal Health Quarterly Aquatic Animal Disease (Asia-Pacific Region) reporting system

<table>
<thead>
<tr>
<th>Country</th>
<th>Disease</th>
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<tbody>
<tr>
<td></td>
<td>EUS</td>
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<tr>
<td>Australia</td>
<td>+</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>+</td>
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<tr>
<td>Cambodia</td>
<td>+</td>
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<tr>
<td>People’s Republic of China</td>
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</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td></td>
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<tr>
<td>Hong Kong China</td>
<td>+</td>
</tr>
<tr>
<td>India</td>
<td>+</td>
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<tr>
<td>Indonesia</td>
<td>+</td>
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<tr>
<td>Iran</td>
<td></td>
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<tr>
<td>Japan</td>
<td>+</td>
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<tr>
<td>Republic of Korea</td>
<td></td>
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<tr>
<td>Lao People’s Democratic Republic</td>
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<tr>
<td>Malaysia</td>
<td>+</td>
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<tr>
<td>Myanmar</td>
<td>+</td>
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<tr>
<td>Nepal</td>
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<td>Pakistan</td>
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<td>Philippines</td>
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<td>Singapore</td>
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<tr>
<td>Sri Lanka</td>
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<tr>
<td>Thailand</td>
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<td>Vietnam</td>
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</tbody>
</table>

+ : occurrence of disease
EUS: epizootic ulcerative syndrome
GID: Grouper iridoviral disease
IMN: infectious myonecrosis
KHVD: koi herpesvirus disease
TS: Taura syndrome
VER: viral encephalopathy and retinopathy
WSD: white spot disease
WTD: white tail disease

Table II
Progress made in the Asia-Pacific region towards the implementation of key elements of the Asia Regional Technical Guidelines on Health Management and the Responsible Movement of Live Aquatic Animals

<table>
<thead>
<tr>
<th>Key elements of the Technical Guidelines</th>
<th>Good</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease diagnosis</td>
<td>8</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Health certification and quarantine measures</td>
<td>10</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Disease zoning</td>
<td>3</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Disease surveillance and reporting</td>
<td>6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Contingency planning</td>
<td>3</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Import risk analysis</td>
<td>2</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>National strategies and policy frameworks</td>
<td>11</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
As can be seen from this table, very limited progress has been made in the area of contingency planning. Contingency planning is an agreed management plan and set of operational procedures that would be adopted in the event of an aquatic animal disease emergency. Everyone in the framework would know their responsibilities and also what action should be taken. Some of the important components of a contingency plan include:

- technical plans (e.g. manuals on disease strategy and general procedures)
- support plans (e.g. financial and resource support)
- operational plans (e.g. a management manual, diagnostic resources, training resources).

All of these components should have clearly designated responsibilities. When a well-documented contingency action plan is agreed upon by all major stakeholders, it should be possible to minimise the impact of an aquatic animal disease emergency.

Contingency planning, early warning and early response are crucial in the effective management of disease emergencies. The aim of early warning is to rapidly detect the introduction of an exotic pathogen or a sudden increase in the incidence of any disease. Early response is identified as all actions that would be targeted at the rapid and effective eradication/containment/mitigation of an emergency disease outbreak.

Experiences in dealing with aquatic animal disease emergencies in Asia were reviewed in 2005 (12). Moreover, the capacity and skills required to develop and implement an effective contingency plan from an Asian perspective have been identified (9). Baldock (3) has provided a framework for the development and implementation of national contingency plans in developing countries. Many of the countries in the Asia-Pacific region fall into this category.

Regional activities to support the management of aquatic animal disease emergencies

Regional workshop

Recognising the importance of aquatic animal health emergencies in the region, the FAO, in partnership with the Government of Indonesia, NACA and the World Fish Centre, organised a workshop entitled: ‘Emergency Preparedness and Response to Aquatic Animal Diseases in Asia’ in Jakarta in 2004. The workshop reviewed regional experiences in responding to disease emergencies, and developed a set of recommendations to prevent, prepare for and respond to aquatic animal disease emergencies in the region (13). Key recommendations include:

- building the capacity and awareness of personnel at the producer, disease-support and decision-making levels
- allocating adequate resources to support the implementation of emergency-preparedness plans
- strengthening the existing regional disease reporting systems (e.g. NACA/FAO/OIE QAAD reports) to ensure increased sharing of information
- establishing regional technical support mechanisms (e.g. the NACA Regional Advisory Group, the NACA three-tier regional resource base) to assist countries in the region
- research into rapid diagnostics, epidemiology, risk analysis and biosecurity to support early warning and early response systems
- providing core funding at national and regional levels to ensure ready resources to respond rapidly to emergencies.

Regional project

The NACA and AusVet Animal Health Services (a private consulting company), in collaboration with other partners (the Association of Southeast Asian Nations [ASEAN] Secretariat, the Aquatic Animal Health Research Institute in Thailand, and the Australian Government Department of Agriculture, Fisheries and Forestry [DAFF]), implemented the ASEAN-Australia Development Cooperation Program’s Regional Partnership Scheme (AADCP-RPS) project, ‘Strengthening Aquatic Animal Health Capacity and Biosecurity in ASEAN’ in January 2006. To accomplish the project objectives, a series of activities were conducted over 18 months. These consisted of two policy workshops, two training courses and a technical mission to four countries.

During the first policy workshop, participants analysed the status of aquatic animal health management plans, capacities and institutional arrangements in ASEAN Member Countries, identified gaps, and prepared an overall work plan to build consensus and support the preparation of harmonised national strategies for aquatic animal health and biosecurity in the ASEAN region. The second policy workshop discussed approaches towards implementing the harmonised national strategies within ASEAN and produced two documents (available at www.enaca.org/health) as outputs of the project:
Recommended Minimum Operational Requirements for Implementing National Aquatic Animal Health Strategies within ASEAN


The first document is expected to provide guidance for ASEAN countries in implementing key elements of national aquatic animal health strategies, including contingency planning. The second document can be used by the ASEAN Sectoral Working Group on Fisheries, and other relevant ASEAN bodies, to monitor the progress of ASEAN Members in implementing national strategies. To achieve some degree of harmonisation, ASEAN Members have identified the following minimum operational requirements for developing a contingency plan:

- a) assess the need for a contingency plan (e.g. generic or specific contingency plan) at a meeting of relevant agencies initiated by the Competent Authority (CA)
- b) identify the power and skills of the relevant organisations which will be involved in implementing a contingency plan
- c) establish a national emergency taskforce of skilled and competent staff
- d) establish a national disease crisis centre
- e) seek government support to ensure adequate legal powers for the emergency taskforce (e.g. closure of farms, destruction of stock)
- f) prepare a list of exotic/endemic diseases for which contingency plans need to be developed
- g) develop an action plan for an emergency, including:
  - quick notification procedures and response
  - mobilisation and communication
  - rapid field investigation
  - enforcing movement restrictions (e.g. of sick animals, water, equipment, people at high risk, etc.)
  - involving people who have livestock in emergency disease control activities
  - ensuring communication between taskforce managers and the CA, government and stakeholders/the public
  - establishing mechanisms for monitoring freedom from disease
- h) develop appropriate legislation and a mechanism for compensation
- i) maintain staff competency and keep an up-to-date register of competent trained staff
- j) establish communication with livestock experts to share experience and expertise.

Two training programmes were conducted for ASEAN Member Countries as part of the ‘Strengthening Aquatic Animal Health Capacity and Biosecurity in ASEAN’ project. The first programme, in Singapore in 2006, focused on epidemiological principles, study design and surveillance while the second programme, for the same group of participants in Vietnam in 2007, focused on contingency planning, zoning and risk analysis.

Technical support was provided to Cambodia, the Lao People’s Democratic Republic, Myanmar and Vietnam during the period between workshops to assist in preparing national strategies. Some of the key tasks accomplished during these training programmes include:

- developing the framework for a national strategy on aquatic animal health management
- identifying national priorities for aquatic animal health
- identifying relevant institutions and their aquatic animal health responsibilities
- forming tentative national aquatic animal health committees
- developing a national list of diseases of concern
- evaluating capacity (laboratory and personnel) for the national list of diseases
- developing a framework for passive surveillance
- developing a framework for contingency planning
- drawing up a list of national staff trained in aquatic animal health and forming a national network
- developing a proposal for a pilot surveillance project.

Regional field guide

The NACA and DAFF have recently produced a regional field guide, ‘Aquatic Animal Diseases Significant to Asia-Pacific: Identification Field Guide’, to promote aquatic animal health surveillance, early response and contingency planning in the region (2). This field guide draws extensively on the health-management experiences and research of Australia and other Asian countries, and thus joins the growing body of practical knowledge published on aquaculture and fisheries in the Asia-Pacific region. This regional field guide covers all the diseases listed in the QAAD reporting system, which includes all OIE listed diseases, plus diseases of regional concern. The field guide is available for free download at http://www.enaca.org/modules/news/article.php?storyid=1003.
Regional resource base

A three-tier regional resource base, established by NACA, consisting of regional resource experts, regional resource centres and regional reference laboratories provides support to member countries in diagnosis, assists in emergency response to new diseases and provides more generalised support in aquatic animal health management. Details about the initiative can be found at www.enaca.org/health.

Regional Advisory Group

An Advisory Group (AG) on aquatic animal health, established by the Governing Council of NACA in 2001, actively supports governments in the region. In general, NACA provides institutional support, while FAO, the OIE and identified experts provide technical guidance. The AG has been meeting regularly since 2002 and, through its recommendations, provides specialist advice to governments in the region, especially on emerging diseases of concern. Recommendations of the past five AG meetings can be found at www.enaca.org/health.

Present status and recent trends in contingency planning in Asia and the Pacific

Australia

Australia has developed an effective emergency preparedness and response programme, known as the Australian Aquatic Veterinary Emergency Plan (AQUAVETPLAN) (1). AQUAVETPLAN comprises a series of manuals outlining national emergency preparedness and response and control strategies. These manuals provide guidance on sound analysis, linking policy, strategies, implementation, coordination and emergency management plans. They include:

- the Control Centres Management Manual, which outlines the appropriate organisational response during an aquatic animal disease emergency, addressing legislative, management and resource issues;
- the Disease Strategy Manuals, which set out the disease control principles for use in an aquatic veterinary emergency incident caused by the suspicion or confirmation of certain diseases in Australia. Each manual is provided in three parts: the nature of disease, principles of control, and eradication, policy and rationale;
- the Enterprise Manual, which describes the emergency response options available for the control and eradication of aquatic animal diseases. This manual also provides a framework for assessing which strategy to use, taking into account several factors (e.g. type of pathogen, management practices and effectiveness of treatment);
- the Destruction Manual, which guides the decision to destroy stock, and covers the choice and application of appropriate techniques based on several considerations (e.g. type of animal, disease and production system, their end use, the possibility of the disease infecting human beings);
- the Disposal Manual, which provides guidance on the safe transportation and disposal of carcasses, animal products and wastes.

These manuals are aimed at government and industry personnel who may be involved in emergency disease preparedness and response. Closer examination of AQUAVETPLAN helps in understanding the extent of the resources required – technical capacity building, infrastructure and finance – to support an optimum national emergency preparedness and response programme.

Thailand

Thailand has made good progress in developing and implementing contingency planning for exotic/emerging diseases. The Thai Department of Fisheries (DOF) has also developed an emergency notification and quarantine system for recognising important emerging and exotic pathogens, such as spring viraemia of carp (SVC) virus and KHV.

Thai contingency planning is the result of a series of meetings and consultations with all relevant stakeholders and government lawyers. This has resulted in the development of a framework for different disease outbreak scenarios (Fig. 1) and an implementation plan (Fig. 2).

In addition, a contingency plan handbook, in three parts, has recently been produced.

Preparation before an outbreak

The local fishery authority needs to locate and map all aquaculture farms and natural bodies of water. An emergency taskforce should be established. Government officers and village leaders involved in the taskforce must be assigned. All vehicles, equipment and disinfection chemicals should be allocated before any outbreak. Emergency exercises should be held to evaluate and modify the emergency system.
Procedures for investigating the outbreak

Once the outbreak starts, a series of investigations and actions will take place immediately. The Fisheries Inspector will immediately order the farm owner to stop exchanging the water and moving fish in and out of the farm. Samples will be collected and sent to a laboratory for epidemiological investigation. If an exotic disease or disease listed in the National Aquatic Disease Control Plan is found, a full outbreak control operation will begin. Establishing a disease control zone and implementing movement controls and monitoring and surveillance activities are fundamental procedures to combat the disease. The plan also contains procedures for destroying diseased aquatic animals and/or disease-carrying animals, for disinfecting farms and equipment, and for paying compensation to farm owners.

Surveillance after an outbreak

Once the outbreak has ended, disease surveillance must continue to ensure that the site remains disease free. Fishery Inspectors will make regular visits to the point of the outbreak, the buffer zone and the surveillance zone. Samples will be collected and transported to the laboratory.

In Thailand, DOF has established a strategy to control the transboundary movement of the following aquatic animal pathogens, using quarantine measures:

- KHV
- SVC virus
- MrN virus
- extra small virus
- white spot syndrome virus
- yellowhead virus
- infectious hypodermal and haematopoietic necrosis virus
- TSV.

Under this system, the Fish Quarantine Inspector conducts inspections at the port of entry. All live aquatic animal shipments are inspected at the port, then must stay at the quarantine facility at the importer’s premises for at least 15 days. During the quarantine period, the Fish Health Inspector visits the quarantine facility and inspects the health of the imported animals. Fish Health Inspectors are fishery biologists or fish pathologists assigned by DOF.

Level III diagnosis (e.g. polymerase chain reaction [PCR], tissue culture) is used to screen all imported aquatic animals. The steps for importing live aquatic animals into Thailand can be summarised as follows:

- pre-importation
- the arrival of aquatic animals and their gametes at port
- post-importation.
**Pre-importation**

Facilities at Thai aquatic animal farms and companies must reach the quarantine standards set by DOF before receiving an import permit.

**Arrival of aquatic animals and their gametes at the port**

Imported animals and their gametes must be accompanied by a certificate of origin and health. The fish are quarantined in the certified quarantine areas of the importing farms or companies.

**Post-importation**

Aquatic animals are kept in quarantine for at least 15 days. Fish Health Inspectors examine the animals for diseases listed by the OIE and other diseases on the national list. The quarantine period will be longer for diseases that require tissue culture techniques for diagnosis. All imported koi (Cyprinus carpio) and goldfish (Carassius auratus) must be quarantined for four to six weeks. If serious pathogens are found, the animals and their gametes are destroyed without compensation. If the fish are free from listed diseases, the importation procedures are complete.

**Cambodia**

Cambodia does not have a national contingency plan to address aquatic animal disease emergencies. In 2006, relevant authorities from key national institutions worked with members of the AADCP-RPS project technical
mission and developed a framework (Fig. 3) for the implementation of national aquatic animal health strategies, including a contingency plan.

**Indonesia**

Indonesia has not yet developed a national contingency plan to deal with aquatic animal disease emergencies. However, during the KHVD outbreak in 2003, some aspects of a contingency plan were implemented in an effort to contain the spread of KHVD. On examining the present distribution of this disease throughout Indonesia, it becomes apparent that this contingency plan was not fully successful in managing the emergency. A detailed account of an emergency response to the mass mortality of carp in Indonesia is provided by Sunarto and Cameron (15).

**Malaysia**

At present, Malaysia does not have a formal contingency plan for exotic or emerging diseases of aquatic animals. However, its Taskforce on Invasive Alien Species does, in some way, cover exotic disease emergencies. The flow chart for contingency planning/emergency preparedness...
proposed for Malaysia under the AADCP-RPS project is shown in Figure 4.

Myanmar

Recently, a Myanmar national contingency plan has been drafted (Fig. 5) under the AADCP-RPS project and submitted to the Director General of the Department of Fisheries to secure the necessary approvals.

Philippines

To date, there is no formal national contingency plan for dealing with aquatic animal disease emergencies in the Philippines. However, under the broad framework of the national strategy on aquatic animal health, action has been taken to deal with disease emergencies, especially after the outbreak of KHVD in Indonesia in 2002. Some of the key actions taken as a part of emergency preparedness include:

– June 2002: temporary suspension of carp importation following the outbreak in Indonesia
– January 2004: the Bureau of Fisheries and Aquatic Resources (BFAR) temporarily suspended koi carp importation following an outbreak in Japan
– August 2004: a national conference, attended by government agencies, scientists, koi breeders, importers and hobbyists, unanimously agreed to develop a diagnostic/detection test for KHV as a prerequisite before lifting the suspension
– October 2004: BFAR fish health staff were trained in using PCR to detect KHV at the Southeast Asian Fisheries Development Center (SEAFDEC), Fish Health Laboratory; their training was then used to optimise the PCR protocol for KHV at BFAR Central Offices
– sampling began of koi from pet shops and hatcheries/breeders

Fig. 4
Proposed flow chart for contingency planning and emergency planning in Malaysia
Solid arrows indicate a mandatory flow of information

Action Plans Needed

Increase awareness and training and address the fear/uncertainties of farmers about reporting disease emergencies and the system/structure of reporting to authority (Aquaculture Division & Units of DOF/NaFish-technical aspects)

– Provide contact details of diagnostic centres to field officers/farmers
– Request a ‘hotline’ number

Describe pathway of reporting and response actions, such as clarifying legal arrangements, including zoning

– Identify (NAC) and provide local resources for implementing emergency response (DOF-Quarantine Division/State Fisheries)
– Develop manuals on disinfection, quarantine, destruction and disposal guidelines for notifiable diseases
– Provide periodical training for emergency taskforce (NAC)
– November 2004: the Fisheries Memorandum Order to lift the suspension of koi and common carp importation was approved
– awareness programmes on KHVD for field officers and koi farmers continued
– November 2004: from this date, surveillance measures were implemented for KHV in collaboration with SEAFDEC
– a flow chart for an emergency notification system was also developed (Fig. 6).

**Singapore**

A generic contingency plan for dealing with aquatic animal disease emergencies is currently under development.

**Vietnam**

The National Advisory Committee of Aquatic Animal Health in Vietnam has identified contingency planning as a priority for the national strategy and is taking steps to develop a generic contingency plan for dealing with aquatic animal disease emergencies.

**India**

A national strategic plan for exotic aquatic species and a set of quarantine guidelines have been approved by the Ministry of Agriculture for implementation. The strategic plan and guidelines (10, 11) cover most of the important elements contained in the ‘Asia Regional Technical Guidelines on Health Management and the Responsible Movement of Live Aquatic Animals’, including a

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**Fig. 5**

Proposed framework for contingency planning in Myanmar

Solid arrows indicate a mandatory flow of information while broken arrows indicate an optional flow of information.
contingency plan. Efforts are now under way to develop generic contingency plans to address aquatic animal disease emergencies.

Other countries

New Zealand has made much progress in the development of aquatic animal biosecurity plans, but as this article focuses on countries that are involved in the NACA regional reporting system details have not been included here. Other countries in the region are yet to make a significant start on the development and implementation of a national contingency plan for dealing with aquatic animal disease emergencies.

Conclusion

Effective contingency planning ensures that all the resources required for the control of a potential disease emergency have been defined and are available, and that these resources can be activated and deployed promptly. Therefore, the establishment of a clear structure of authority for effective decision-making and action is essential. Advance planning and rapid action can significantly reduce the social and economic impacts of aquatic animal disease, as well as control or reduce its spread. Under rare, but opportune, circumstances, contingency planning may even be effective in eradicating the disease agent. With contingency planning, a country can provide a rapid and planned response for the containment of a disease outbreak, which can greatly reduce the impact, scale and costs of the outbreak.

As demonstrated by this review, many countries in the Asia-Pacific region have yet to implement an effective contingency plan. Strong national commitment and continuous awareness and capacity building at the producer, disease support and decision-making levels are vital in ensuring the effective implementation of an early warning and response system to deal with aquatic animal health emergencies. The provision of core funding at national and regional levels to provide ready resources to respond rapidly to emergencies will ensure the effective implementation of national contingency plans.
La conception des plans d’urgence en cas de maladie des animaux aquatiques dans la région Asie-Pacifique

C.V. Mohan, S. Chinabut & S. Kanchanakhan

Résumé
Les transferts d’animaux aquatiques vivants sont l’un des principaux facteurs de l’augmentation du nombre d’urgences sanitaires survenant en Asie et au Pacifique. Les plans d’urgence sont une condition essentielle pour répondre efficacement à ces situations. En Asie, les « Lignes directrices techniques régionales sur la gestion sanitaire et les transferts responsables d’animaux aquatiques vivants » régissent les efforts déployés aux niveaux national et régional pour réduire le risque de propagation transfrontalière des maladies. Cependant, les progrès accomplis par les pays de la région pour concevoir des plans d’urgence conformément à ces lignes directrices restent à ce jour insuffisants. Les auteurs examinent les grandes lignes des programmes de gestion sanitaire mis en œuvre, soulignent quelques initiatives régionales d’appui aux plans d’urgence et font le point sur la situation actuelle des plans d’urgence dans la région Asie-Pacifique.

Mots-clés
References


