Aquatic Emergency Preparedness and Response System in Thailand

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Abstract

In Thailand, Department of Fisheries (DoF) is the competent authority for various aspects of aquatic animals including aquatic animal health. There are two principal legislation giving DoF power to apply for aquatic animal disease prevention and control measures in the country as well as import-export control; namely, Royal Ordinance on Fisheries and Animal Epidemic Act.

DoF has two national reference laboratories for aquatic animal health, one is Aquatic Animal Health Research and Development Division (AAHRDD) for freshwater aquatic animal disease diagnosis and another is Songkhla Aquatic Animal Health Research Center (SAAHRC) for brackish water aquatic animal disease diagnosis. Both are ISO/IEC 17025 accredited laboratories. Besides, there are 19 regional laboratories of DoF located in different areas of the country. All of 21 laboratories are responsible for performing disease diagnosis service for fish farmers as well as for disease surveillance. There are a number of surveillance and control programs for aquatic animal diseases in Thailand. Passive surveillance: information can be collected from disease reporting and other sources such as scientific research, news, publications, social network, or rumor. Active surveillance: to provide assurance of disease status for trade purposes, DoF has setup nationally active targeted surveillance program for demonstrating a number of diseases free status of country or farm establishment in accordance with OIE Aquatic Animal Health Code.

There are several farm standards in Thailand such as Good Aquaculture Practices for Hatchery of Disease Free Pacific White Shrimp, Good Aquaculture Practices for Marine Shrimp Farm, and Aquaculture Establishment for Export of Aquatic Animals. Each standard includes necessary biosecurity practices in order to prevent the introduction of pathogenic agent into or spread within or release from the farm. To control domestic movement of live aquatic animals, in normal situation, Aquatic Animal Movement Document should be gained when purchasing as it is beneficial to traceability. However if the disease free zone or disease zone is announced according to Animal Epidemic Act, all transportation of target aquatic animals or carcasses in or out of the defined zone is prohibited, unless a written permission is obtained.

DoF had developed contingency plan for dealing with aquatic animal disease emergencies. In contingency plan, the Provincial Fisheries Officer in responsible area will act as Director of Emergency Aquatic Animal Disease Control Center while Inland Aquaculture Research and Development Center/Coastal Aquaculture Research and Development Center/AAHRDD/SAAHRC will act as disease investigator and laboratory testing. DoF maintains early warning system by supporting staff to attend the meeting and workshop where there is occurrence of new disease, regularly checking local/regional/international disease report database, communicate with competent authority of trade partner, and regularly reporting disease situation to regional and international system. For early detection system, DoF has not only supported expertise and facilities required for laboratories to diagnose different diseases but also conducted training courses for fish farmers, traders and DoF staffs to recognize signs of the listed disease and emerging disease and encouraged them for rapid reporting of the event to the nearest DoF agency for the purpose of immediate investigation. For early response system, when there is serious disease outbreak, aquatic animals in that epidemiological unit should be contained in safety area. Waste water also should not be released from that area without disinfection. Meanwhile, the DoF staffs should investigate the outbreak urgently in order to define disease zone and find out what factors associated with the outbreak so that the disease management or control measure can be applied properly.

Introduction

Department of Fisheries (DoF) is the national government agency responsible for all activities in the production of aquatic animals which also includes managing the country's aquatic emergency disease preparedness and response system in Thailand. The agencies under DoF involved in preparedness and response to emergency aquatic animal diseases include Aquatic Animal Health Research and Development Division (AAHRDD), Inland Aquaculture Research and Development Division (IARDD), Coastal Aquaculture Research and Development Division (CARDD), Fish Quarantine and Inspection Division (FQID), and Provincial Fisheries Office (PFO).

There are two principal legislations giving DoF power to apply for aquatic animal disease prevention and control measures in the country as well as import-export control; namely, Royal Ordinance on Fisheries and Animal Epidemic Act. The Royal Ordinance on Fisheries imposes on registration and various standards related to aquatic animals. The Animal Epidemic Act is operated by Department of Livestock Development (DLD). However, DOF staffs have been appointed by the Minister of Agriculture and cooperatives to be the authorized inspectors and authorized veterinarians to execute the Animal Epidemic Act for prevention and control of aquatic diseases.

Early Warning System

National competent authority's monitoring system/mechanism on emerging/existing transboundary diseases (especially the OIE-listed)

DoF gathers information about aquatic animal disease events in other countries by attending meetings and workshops related to aquatic animal diseases, communicating with researchers in other countries, checking local/ regional/ international disease report database, scientific literatures and newsletter, accessing website of Network of Aquaculture Centres in Asia-Pacific (NACA) and World Organisation for Animal Health (OIE) and communicating with the competent authority (CA) of trade partner when the serious disease or pathogen is detected from the imported aquatic animal. DoF not only checks disease status in other countries but also contributes the aquatic animal health situation within the country for others by regularly reporting to regional and international system. As Thailand is one of the NACA and OIE member countries, the national focal point, a Fisheries Biologist from AAHRDD is responsible for collaborating and communicating with NACA and OIE as well as reporting the status of aquatic animal health in Thailand to NACA/ OIE Regional Representation of Asia and Pacific through OIE delegate (DG of DLD) every three months and to OIE Headquarters through the World Animal Health Information System (WAHIS) every six months.

Networking mechanisms of the national competent authority with trading partners

DoF, by AAHRDD, and key aquatic animal commodity trading partner countries (usually competent authority) communicate mainly with email or telephone or official letter.

Early Detection System

Personnel competencies on recognition and reporting of a disease emergency

a. Frontline personnel and local government personnel

DoF staff (aquatic animal health professionals are Fisheries Biologists of AAHRDD), Songkhla Aquatic Animal Health Research Center (SAAHRC; agency under AAHRDD), Inland Aquaculture Research and Development Centers (IARDCs; agencies under IARDD), Coastal Aquaculture Research and Development Centers (CARDCs; agencies under CARDD); fisheries extension officers are Fisheries Biologists of PFOs; officers of local disease control centers or Emergency Aquatic Animal Disease Control Centers are Fisheries Biologists of PFOs) and fish farmers have been trained to recognize signs of the national-listed aquatic animal diseases, emerging disease, or unexplained mortality especially in Level I diagnosis. In addition, a number of leaflet, manuals, and other publications have been distributed to frontline individuals at the pond level from time to time.

DoF has encouraged the farmers, and farmer associations for rapid reporting of the event to the nearest DoF agency (PFO/ AAHRDD/ SAAHRC/ IARDC/ CARDC) for the purpose of immediate investigation.

b. National government personnel

Appropriate disease surveillance plan as well as rapid and accurate diagnosis are highly important. When the emerging disease or pathogen is confirmed, laboratory staff will notify to the Emergency Aquatic Animal Disease Control Center for early warning and inform the national OIE focal point and NACA coordinator to report to OIE and NACA.

Standard Operating Procedures

SOPs or instruction materials related to early detection system such as:

- Documents provided for training staffs of PFOs, AAHRDD, SAAHRC, IARDCs, CARDCs, Fish Inspection Offices (FIOs; agencies under FQID) and farmers on basic diagnosis of aquatic animal diseases
- SOP for disease diagnosis (level I, II and III) provided for AAHRDD, SAAHRC, IARDCs, and CARDCs
- Publication such as pamphlets, posters, leaflets that described signs of diseases, prevention and control
- SOP for disease surveillance provided for AAHRDD, SAAHRC, IARDCs, and CARDCs
- SOP for aquatic animal health inspection and control in quarantine facilities provided for staffs of AAHRDD, SAAHRC, IARDCs, and CARDCs
- Documents provided for training staffs of PFOs, AAHRDD, SAAHRC, IARDCs, and CARDCs on disease reporting.

Awareness building and training programs

AAHRDD and SAAHRC usually update their websites in order that DoF staffs, farmers, industry personnel and others can access the disease status/events in the country and other countries. AAHRDD and SAAHRC also revise a number of publications and produce new ones every year.

Moreover, if there is a serious disease occurring and some measures are needed to be taken, DoF staffs and farmers will be invited to attend the meeting for further collaboration. AAHRDD and SAAHRC have planned and set up a budget for training programs for DoF staffs and farmers every fiscal year.

National information sharing networks

Emergency preparedness and response related information are shared through internet website, social network, workshop and meeting.

Surveillance systems

DoF has been allocating a large amount of budget for both active and passive disease surveillance in order to gain information on the health status of aquatic animal population for assessing and managing risks associated with trade or for effective response to disease emergency.

a. Active surveillance

DoF has conducted national active targeted surveillance programs. Majority of active surveillance programs are designed for demonstrating disease free status of country or farm establishment. However, in case of the disease that has been reported in the country, though there is surveillance program for demonstrating freedom from disease at farm level, national surveillance program for assessing the prevalence of the disease is also set up. Up to now DoF can claim disease free status based on active targeted surveillance for 14 diseases at country level (10 for fish diseases and 4 for crustacean diseases) and 11 diseases at farm establishment level (4 for fish diseases, 6 for crustacean diseases, and 1 for amphibian disease).

b. Passive surveillance

As a part of a country's early detection system, when fish farmers or other organizations have experienced disease problems on their aquatic animals, consultation by calling or submitting the samples to AAHRDD/SAAHRC/IARDCs/CARDCs for disease diagnosis is available.

Disease reporting system (national and international authority; e.g. NACA/OIE)

There are 34 diseases in the national list of reportable diseases under Animal Epidemic Act. This list includes OIE listed diseases and additional diseases. Since Animal Epidemic Act imposes aquatic animal owner to notify the inspector or veterinarian (DoF staff who has appointed to be inspector or veterinarian) when (1) there is an

animal which is known to be infected with national listed pathogen; (2) there is an animal which is sick or dead from an unknown cause; (3) in the same village or adjacent area, there is an animal which is sick or dead with the same symptoms during a seven-day period, therefore, when suspected disease occurs the animal owner can report to the nearest agency (PFO/AAHRDD/SAAHRC/IARDC/CARDC) by facsimile, telephone, or in person. In case of reporting to PFO, the PFO will then inform AAHRDD/SAAHRC/IARDC/CARDC to conduct disease investigation and diagnosis. If IARDC/CARDC is unable to identify the disease/pathogen, the sample will be sent to national reference laboratory, AAHRDD or SAAHRC, for identification and confirmation. If that suspicion is confirmed to be the OIE listed disease or emerging disease, it would be reported to OIE and NACA.

Diagnostic capability/capacity

DoF has two national reference laboratories for aquatic animal health, one is AAHRDD for freshwater aquatic animal disease diagnosis and another is SAAHRC for brackish water aquatic animal disease diagnosis. The National laboratories have capability/capacity of confirmation of a disease or disease agent of concern, including ability to differentiate exotic or emerging diseases from endemic diseases. There are parasitology, bacteriology, histology, mycology, immunology, molecular biology, and virology laboratories at AAHRDD and SAAHRC. Laboratory staffs are regularly trained in aquatic animal disease diagnosis for enhancing their performance. For assurance of laboratories' performance, significant internal audit is performed at least once a year. These laboratories have also participated in proficiency testing (PT) programs provided by external organizations such as the Australian National Quality Assurance Program (ANQAP) and Arizona University, one of OIE reference laboratories. AAHRDD and SAAHRC laboratories are accredited for ISO/IEC 17025. Besides, there are 19 regional laboratories of DOF located in different areas of the country. DoF has continuously supported expertise and facilities required by all laboratories to diagnose different diseases and encouraged them to achieve international accreditation for disease diagnosis laboratory. All of 21 laboratories are responsible for performing disease diagnosis service for fish farmers as well as for disease surveillance.

Early Response System

Personnel competencies on identification of a disease emergency, identification of risks associated with the suspected pathogen, confirmation of the aetiology/etiologic agent of the disease, reporting to competent authority, formulation of control options

a. Frontline personnel

Fish farmers especially those who are registered for farm standards know that the aquatic animal that will be introduced into the farm should come from a source with health status at the same level or higher level than their farm. Both moving in and out of aquatic animal, farmers should have movement document or record sheet for traceability. When the suspected disease occurs, they can coordinate and provide relevant information on disease outbreak to PFO/ AAHRDD/ SAAHRC/ IARDC/ CARDC for early response.

b. Government personnel

DoF staffs, PFOs/AAHRDD/SAAHRC/IARDCs/CARDCs, understand their role and responsibility to combat the emergency disease in accordance with contingency plan.

When staffs of PFO are informed that there is an outbreak in their responsible area, they would seek for assistance from AAHRDD/SAAHRC/IARDC/CARDC in order to communicate and assist the affected farmers. While waiting for disease diagnosis at the laboratory of AAHRDD/SAAHRC/IARDC/CARDC to identify whether it is emergency disease or endemic disease, containment of affected aquatic animal and waste water is conducted to prevent spreading the suspected pathogen. In the meantime AAHRDD/SAAHRC/IARDC/CARDC will investigate the outbreak urgently in order to define disease zone and find out what factors are associated with the outbreak so that the disease management or control measure can be applied properly.

Awareness building and training

When a serious disease occurs and some measures are needed to be taken, DoF staffs and farmers will be invited to attend the meeting for further collaboration.

Every year AAHRDD and SAAHRC have planned and set up a budget for training programs for DoF staffs and farmers to enhance their knowledge in quarantine system, sanitary and health management, disease diagnosis, disease reporting etc. At the end of training, the participants are evaluated to ensure that they understand and will be able to undertake the responsible tasks on early response.

Standard Operating Procedures

DoF has a contingency plan for dealing with general aquatic animal disease emergencies. This contingency plan manual describes steps in action to be taken such as preparedness prior to disease outbreak, action to be taken if a suspected disease occurs or in case of disease outbreak, and action to be taken after disease outbreak. This manual also includes flow charts, forms, SOP for disinfection, and SOP for collecting, packaging and transporting samples to laboratories.

At present, DoF is developing disease-specific plans for IMN and KHV. The detail of the draft of IMN contingency plan consists of:

- Introduction
- Objective
- Glossary
- Legal powers
- Chain of command
- Preparedness prior to disease outbreak
    - Preparing for registered shrimp farm data and map
    - Personal requirements and responsibilities
    - Preparing for materials, equipment and vehicle
- Operation when IMN occurred
    - IMN investigation
    - Sample collection
    - IMN diagnosis
    - Containment
    - Handling and disposal of dead shrimp
    - Eradication
    - Disinfection procedures
    - Surveillance for establishing successful eradication
    - Reporting
    - Public awareness etc.