

Aquatic Animal Health in Myanmar

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Abstract

In 2010, several viruses infected *Penaeus monodon* in the ponds of Myanmar. This includes the White Spot Syndrome Virus (WSSV) which causes the White Spot Disease (WSD). In addition, Taura Syndrome Virus (TSV) and Infectious Hypodermal and Haematopoietic Virus (IHHNV) were detected in *P. monodon* samples from Ayeyarwaddy Region (western part of Myanmar). In 2014, the Yellowhead Virus (YHV) was also detected in shrimp samples for export. The occurrence of these shrimp diseases has resulted to a devastation of the shrimp industry in Myanmar. Because of this, most of the shrimp farmers have shifted to extensive or traditional shrimp farming. The Aquatic Animal Health and Disease Control Section (AAHDCS) of the Department of Fisheries (DoF) is responsible for formulating action plans to control and prevent aquatic animal diseases. Thus, in order to be updated with the latest techniques on disease detection and management of emerging diseases, the AAHDCS should improve the capacity of the departmental personnel, upgrade the laboratory equipment, and improve the facilities.

Introduction

Myanmar is a country that is rich in marine and inland fishery resources with a total of 486,000 square kilometers of marine fishery areas and a coastline of 2,832 kilometers. The country also has several inland water bodies such as natural lakes, reservoirs, rivers, and ponds which cover an area of about 8.1 million hectares. Thousands of families in Myanmar rely on inland fisheries as their livelihood. Moreover, inland fisheries also contribute to the national revenue which led to an effort by the government of Myanmar to

increase fish production through culture-based capture fisheries.

Aquaculture is one of the main contributors to the national economy of Myanmar. The land area for fish and shrimp ponds are approximately 91,653 ha and 92,681 ha, respectively (Wah & Than, 2016). The country is known for its production of freshwater fishes, including the culture of rohu (*Labeo rohita*). These freshwater species do not only provide supply for domestic consumption, but also

for neighboring countries. However, the people of Myanmar prefer freshwater fish over marine fish, thus the Government of Myanmar laid out a policy to target marine fish for the export market.

In the 1970s, shrimp culture in Myanmar started by using a trap and hold method. Postlarvae (PL) of *Penaeus monodon* were trapped into ponds during high tide. However, there were no available information on pond preparation, eradication of predators, water fertilization, and feeding. As the ponds were usually as large as 50 to 100 ha, shrimp production provided more than enough income for the shrimp farmers (Thame & Maye, 2005).

In 2010, the Department of Fisheries, Ministry of Agriculture Livestock and Irrigation (MOALI) implemented a 3-year project which aims to develop three types of shrimp farming: extensive, extensive plus, and semi-intensive (Wah & Than, 2016). This was followed by another 3-year project which focuses on the development of an intensive culture system (Saw, 2004). The total area for semi-intensive shrimp ponds is 24,536.29 ha, 61,059.63 for extensive plus shrimp ponds, and 169,818.54 ha for extensive or traditional shrimp ponds with a total land area of 235,474.46 ha. The total production of freshwater prawn and marine shrimp in 2017 was 35,694.20 metric tons. Recently, the Department of Fisheries encouraged the practice of fish and shrimp culture in every states and regions for self-sufficiency of local consumption and increasing for export market (DOF, 2017). However, in recent years, many hatcheries including private and public are facing difficulties on availability of sufficient amount of shrimp broodstocks when required. Therefore, local shrimp hatcheries could not produce enough shrimp seeds for local demand and

shrimp post larvae had to be imported from neighboring countries such as Thailand and Bangladesh. Import numbers of shrimp larvae from Bangladesh is not yet available. In 2017–2018, tiger shrimp, freshwater prawn and white shrimp larvae were imported (57.99 million) from Thailand. *Penaeus vannamei* has many advantageous factors for culture but it may also cause the negative impact to other shrimp aquaculture industry. DOF has been aware that *P. vannamei* may be a carrier and may result in the outbreak of TSV. After a regional workshop in 2005 in Manila that assessed the culture of *P. vannamei*, ASEAN countries agreed to culture with proper documentation. At present 3–4 private farms are culturing *P. vannamei* at experimental scale. Only PCR negative SPF *P. vannamei* seeds are permitted to be imported for culture in domestic water. In 2017–2018, a total of 61.58 million *P. vannamei* larva were imported (Regional Technical Consultation, 2005). Recently, the most prominent development of white shrimp culture is in Tanintharyi Region at Pyay Pho Tun Co. Ltd. The company initiated the farming of white shrimp in 2016 and continuously invested in its production. In 2017, the company produced 1334.936 MT of white shrimp and 1,006,194 MT in 2018.

The Department of Fisheries (DoF) is responsible for the management and sustainability of the fisheries development in Myanmar. The major goal of the department is to enhance food security by increasing fish production not only for domestic consumption but for export as well. The DoF also focuses on forming strategies to promote proper aquatic animal health management so that the occurrence of disease in hatcheries and grow-out facilities can be controlled and prevented (Wah & Than, 2016).

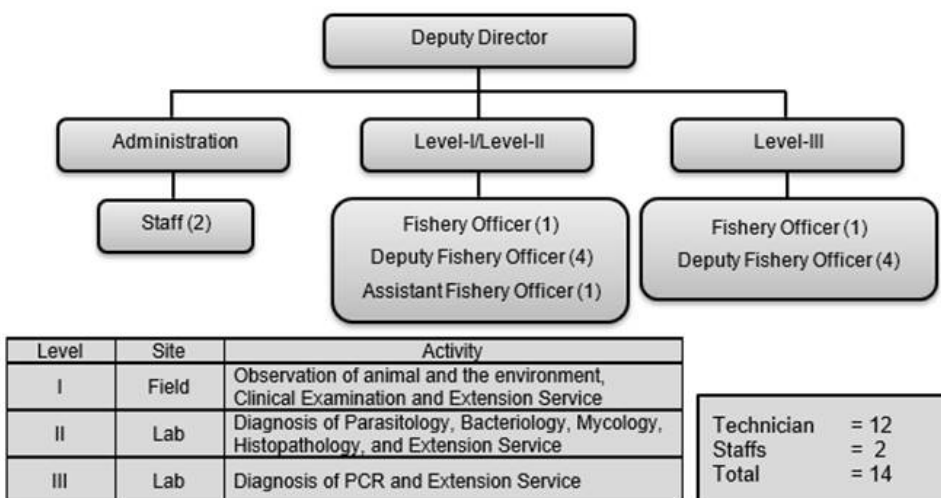


Figure 1. Organizational chart of the Aquatic Animal Health and Disease Control Section of the Department of Fisheries in Myanmar

The AAHDCS has been conducting surveillance using Level-1 disease diagnosis. The activities covered in the surveillance include the following:

- (a) report from the Township Fisheries Officers;
- (b) report from the farmers directly to the aquatic animal health section;
- (c) occasional field visit of Township Fisheries Officers to farm sites; and
- (d) recording of reports on disease occurrences.

The AAHDCS has also the capability to conduct Level-II diagnosis, i.e., through histopathology and microbiology; however, upgrading of equipment and training of staff must be undertaken.

Shrimp disease in Myanmar

Notably, the AAHDCS laboratory has the capability to conduct Level-III diagnosis such as the use of PCR method to detect shrimp viral diseases including White Spot Disease (WSD), Infectious Hypodermal and Haematopoietic Necrosis (IHHN), Taura Syndrome (TS), and Yellowhead Disease (YHD). In addition, the AAHDCS laboratory plans to establish the diagnostic methods for AHPND following the suggested methods in the OIE Manual.

Fish disease in Myanmar

Viral Disease

Epizootic Ulcerative Syndrome (EUS) Disease

Cause of disease: EUS is a seasonal disease

Species affected: More on freshwater fish species

(Especially in carps, snake head, etc.)

Bacterial Disease

Vibriosis Disease

Cause of disease: usually occur in the warm summer month

Species affected: Grouper, sea bass, milkfish

c) protect the invasion (prevent the entry) of disease carriers

d) send specimens and report suspected cases to Disease Section

e) collection of fish/shrimp diseases information by active and passive reporting systems

Mobile teams regularly visit premises before export and provide necessary instructions.

Also, training on aquatic animal health management is provided to fish/shrimp farmers and students

f) issuance of health certificate after the animal has been examined to be healthy and free from any clinical sign of disease

g) checking of transboundary diseases in live aquatic animals for import or export being performed at Yangon International Airport

Disease prevention and control measure

In Myanmar, the following are the action plans of AAHDCS to prevent and control aquatic animal diseases (Wah & Than, 2016):

- a) maintain good water quality and pond environment
- b) minimize stress during handling and transportation

Table 1. Levels of disease diagnosis and corresponding activities at the Aquatic Animal Health and Disease Control Section of Myanmar (Wah & Than, 2016)

Level	Site	Activities
I	Field	Surveillance, observation of animal and the environment, clinical examination and extension service
II	Laboratory	Diagnostics (parasitology, bacteriology, mycology, histopathology) and extension service
III	Laboratory	Diagnostics (PCR for WSSV, YHV, TSV using the IQ 2000TMKit) and extension service

- h) dissemination of pamphlets for aquatic animal disease information and prevention of aquatic animal diseases
- i) regular submission of quarterly report on aquatic animal diseases to the Network Aquaculture Centers in Asia-Pacific (NACA) and OIE

Control Section in Yangon should be upgraded to meet the requirements of an international standard laboratory.

- The Central Disease Lab is in need of complete renovation.
- Laboratory manuals are not in place for PCR/ Histopathology/ Parasite/ Bacteria.
- The Histology Lab should be set up.
- Trainings on basic diagnosis of parasites, viruses, bacteria and fungi on major culture species such as carps, shrimps, and marine fin fishes should be undertaken.
- It is also necessary to conduct a training on diagnostic capability especially at the Bacteriology and Histology laboratory (Level-II)
- Currently, tests on marine fishes such as grouper and seabass (at Myeik Region) cannot be conducted due to the unavailability to viral test kits.

Future plan

Aquaculture areas are currently expanding. Consequently, the occurrence of diseases cannot be prevented. Thus, the adherence to good aquaculture practices should be always followed. The AAHDCS of the DOF plays a significant role in controlling and preventing aquatic animal diseases by formulating action plans. Thus, it is important to upgrade laboratory equipment and facilities. Trainings such as the detection and management of aquatic animal diseases should also be conducted.

Training needs and requirements

- A diagnostic laboratory at the Aquatic Animal Health and Disease

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