

## Country report from China

Jianguang FANG\*<sup>1</sup>

### General remarks on the Manila clam fishery

Over 2 million tons of Manila clams *Ruditapes philippinarum* (Adams et Reeve) were produced each year on the coast of Yellow Sea, Bohai Sea and East China Sea of China. Most of this production occurs in Liaoning, Shandong and Fujian Provinces. In addition, a significant Manila clam seed production industry has developed with pond production facilities in Fujian province. Before 1970's, all farmed seeds of Manila clam relied on natural. Farmers collected seed of Manila clam from natural inhabit. By the late of 1970's, the seed production technology of Manila clam in ponds was developed rapidly and achieved great success in Fujian Provinces because the natural seed could not enough to meet the demand from farming.

Since 1990's, the Manila clam industry has developed rapidly in China prompted by the demand from domestic and abroad. In order to meet the increasing demand of seed from whole China, the seed production of Manila clam in reclamation areas was became the major sources of seed of manila clam for farming in China. In 2013, the total seed production in Fujian province was 7952 tones with shell length about 1cm. Meanwhile, the Manila clam is also the major species farmed with shrimp, fish, crab in form of pond integrated multi-trophic aquaculture, which is practiced in commercial scale in Zhejiang and Fujian Provinces.

In history, the farming of Manila clam was mainly carried out in tidal zone and subtidal zone before 1980's. An unfilled domestic and overseas demand was pushing attempts to increase production of this clam from 1990's. The farming areas of the clam has extended from intertidal zone to shallow sea with the depth of about 10 m in Shandong and Liaoning

provinces. Because of longer time immersing in water and richer supply of phytoplankton, the growth rate and suitable harvest time of the clam cultivated in deeper water is much higher and longer than that of clam growing in natural inhabits. The main problems for such farming are the predation from crab, starfish and sea snails.

The farming space decreasing mainly due to sea reclamation along the coast and the pollution from lands are being the major threaten to Manila clam industry in China

### Basic information on fishery

**Geography and geomorphological characteristics:** Manila clam fishing is mainly operated in tidal flats and shallow waters in calm inner bay with sandy and sand-muddy habitat.

**Fishing method:** Short shaft raking in tidal flat, long shaft raking in subtidal water, clam dredge and hydraulic dredge in deeper water.

**Fishery management:** Fishing closed season from June 1 to August 31.

**Standing stock assessment:** Statistical survey by local governments and fisherman's associations.

### Basic information on aquaculture

**Environmental characteristics:** Aquaculture of the Manila clam is mostly done in tidal flats, subtidal zone and deeper waters (<10 m) in China.

**Culture methods:** Bottom culture is the main farming method by reseeding natural juveniles, and artificial seeds produced in Fujian Province. Pond culture is being developed recently with Integrated Multi-trophic Aquaculture models in Zhejiang and Fujian Provinces.

2016年1月29日受理 (Received on January 29, 2016)

\*<sup>1</sup> Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Science, Qingdao 266071, China  
E-mail: fangjg@ysfri.ac.cn

**Operational management:** In some intensive farming areas, such as Jiaozhou Bay in Qingdao, the rotate culture patterns was adapted in order to control the total production is lower than carrying capacity.

#### **Major constraints and countermeasures**

**Habitat degradation:** Habitat area of the Manila clam significantly decreased by reclamation in the last decade along the coastline of China. Dam construction caused the change of current, bottom substrata directly or indirectly. Eutrophication caused by human activities was another harmful stress to habitats of Manila clam.

**Overfishing:** Over catching has destroyed the clam population in many places since the 1980s. It seemed

to be the most possible cause for rapid decrease of the clam production in Shandong, Liaoning and Fujian Provinces. Nowadays, there is almost no natural Manila clam fishing.

**Diseases and parasites:** No great attention is paid on prevalence of diseases and parasites on Manila clam. Abrupt mortality occurred in summer, especially occurred after heavy storm has recorded in Jiaozhou Bay, Qingdao recent years.

**Climate change:** Change of food environment is considered to be associated with acidification.

**Economic aspects:** Relatively low farm gate price.

**Proposed international collaborative studies in the future:** Natural habitat recovery and improvement for Manila clam. Influence of Acidification on development and growth of Manila clam.