Mariculture in Vietnam: Present Status and Strategy Development

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Vietnam has more than 3200 km long of coastal line with many close bays and coastal areas, thousands hectares of brackish and marine areas with favourable of natural conditions which are preferable for mariculture development. But, mariculture in VietNam heve just develop some years ago. However, Vietnamese Government hopes to reach the target 200.000 tons of mariculture fishes by the year 2010.

1. Mariculture in Vietnam national economy:

Vietnam has more than 3200 km long of coastal line with many close bays and coastal areas, which are preferable for mariculture development. Furthermore, Vietnam has thousands hectares of brackish and marine areas, which can use for mariculture (fish, mollusca and other species). After few years developed, Vietnam has become one of the top countries in which has highest shrimp production in the world. In 2005 : Total production of fisheries of Vietnam is 3,432 milion tons include : Aquaculture 1,437 milion tons : 330.000 tons of Shrimps, 400.000 tons of cashfishs; crabs 22.289 tons; Molusc 114.570 tons; seaweed 20.257 tons. With its appropriate potentiality and natural conditions, Vietnam wish to develop mariculture and bring it to an important sector that contributes to economic development, creating jobs, poverty alleviation, and increasing living standard for the people.

Regarding to market, Vietnam has its great potentiality in marine fisheries. Shrimp, fishes, mollusca are preferable food. In Vietnamese daily diet, the amount of protein comes from aquatic product accounts for 40-50%. Marine fishes are preferred to freshwater fishes because of its value. With Vietnamese population of more than 80 millions people, living standards are increasing day by day, Vietnam has its demand for seafood up to millions tons yearly. Cities, Industrial zones are forming which creates a market for consuming seafood locally. Like Japanese, Chinese, Vietnamese like live-seafood, which mostly come from aquaculture only. Furthermore Vietnam is near Hongkong and Western-Southern China markets. In recent years, ten tons of mariculture products such as grouper, clam, and lobster...are selling daily in these markets.

With nearly 30 coastal provinces and half of the Vietnamses population living in coastal areas, mariculture plays an important role in poverty reduction. From the end of 20th century, Government of Vietnam had policies to reduce fishing, especially fishing in coastal area. In the last 5 years, marine fishing production are increasing unremarkably, which mainly come from offshore fishing. The Government has issued policies support fishermen shifting from fishing to aquaculture. These policies promoted the important role of mariculture in Vietnam economy. Although mariculture has just developed for 3-4 years, Ministry of Fisheries of Vietnam has carried out its master plan for sustainable development as a guidelines for, local authorities plan its detailed aquaculture areas and issue their own policies to increase the development of mariculture. Government of Vietnam hopes to reach the target 200.000 tons of fishes in mariculture by the year 2010 together with its specific policies and methods.

2. Current status of mariculture in Vietnam

2.1.Seed reproduction :

Vietnam has started to research fish reproduction since 1996-19974. Until 2005, the following fishes species are managed to reproduct:

1. Brow spot grouper (Epinephelus coioides):

Currently, Research Institute of Aquaculture No. 1 (RIA 1) can reproduct Brow spot grouper with survival rate from larvae to fry 60 days (4-5cm) is 13-15%, 90 days (8-10 cm) is 8-9%. Every year, with its facilities, RIA 1 can reproduction nearly 400.000-500.000 fries. This technology has been transfered to local areas in order to meet the demand of commercial mariculture.

2. Cobia (Rachycentron canadum)

Rachycentron canadum is a species for mariculture with high commercial value. Currently, Vietnam is one of the rare countries, which have successfully research and set up the breeding technology and commercial mariculture processes. The mature rate of broodstock about 65-78%; spawing rate are more than 70%, the rate of fertilized eggs are more than 60%, the hatching rate of eggs are more than 70%. Survival rate from larvae to fingerling (5-6 cm in length) achieve average of 5%. In 2005, survival rate has been increased up to 15-20%. The technology has been transfered by RIA 1 to some hatcheries. Presently 3 years, RIA 1 has reproduction around 250.000-400.000 fish fries (5-6 cm)/year supplied to mariculture.

3. Red drum (Scyaenops ocellatus)

In 2003, artificial seed reproduction technology has been managed. The rate of mature parents which participate in spawning is more than 72%, the rate of fertilized eggs are more than 75%, the rate of hatched eggs are more than 80%, survival rate from larvae to 60 days fry are more than 22%. In 2003, it was produced 350.000 fish fry, 400.000 fish fry in 2004 and 500.000 in the year 2005. The technology can be transfered to hatcheries to increase the number of fish fry.

4. Seabass (Lates calcarifer) and (Psammoperca waigensis)

The RIA II and University of Fisheries have researched this technology successfully. Now RIA I can manage this technology and transfer to hatcheries. In 2005, research stations reproduction more than 400.000 fish fries (3-4 cm in length) to supply to mariculture.

5. Moluscs, crabs and other species :

Vietnam have successfully research on artificial seed reproduction of mudcrab, swimming crab, Sea urchin, Babylonia snail

Table 1: Research results and propagation of marine fishes 2005

No.	Species	Name of research institute	No of reproduction fish fry
1	*Brow spot grouper (Epinephelus coioides)*	*RIA 1*	*400.000 fries*
2	*Cobia (Rachycentron canadum)*	*RIA 1*	*500.000 fries*
3	*Red drum (Scyaenops ocellatus)*	*RIA 1*	*500.000 fries*
4	*Seabass (L. calcarifer; P. waigensis)*	*RIA II*	400.000 *fries*
5	*Mud crab, swimming crab, Babylonia snail, Sea urchin*	*RIA II*	Non data

2.2 Culture: :

2.2.1 Species for mariculture:

Table 2: Mainly species, which use for mariculture in Vietnam, are from following sources:

No	Species	Sources of seed
1.	*Epinephelus coioides*	Hatchery + Wild
2.	*E. tauvina*	Wild + Hatchery
3.	*E. malabaricus*	Wild
4.	*E. Blekeri*	Wild

5.	*Rachycentron canadum*	Hatchery
6.	*Lates calcarifer*	Hatchery + Wild
7.	*Psammoperca waigensis*	Hatchery
8.	*Lutjanus erythropretus*	Wild
9.	*Saparus sarba*	Wild
10.	*Scyaenops ocellatus*	Hatchery
11.	*Siganus sp*	Wild
12.	*Mud crab*	Hatchery + Wild
13.	*swimming crab*	Wild + Hatchery
14.	*Babylonia snail*	Hatchery + Wild
15.	*Sea urchin*	Wild

2.2.2 Cage culture

According to the Department of Aquaculture (Ministry of Fisheries), total cages in 2004 were 40.059 cages (not including cages for cultivated pearls). Production of fishes estimated for the year 2005 is 5000 tons, lobster 1795 tons.

Cage culture developed mostly in Quang Ninh , Hai Phong, Thanh Hoa, Nghe An, Ha Tinh, Phu Yen, Ba Ria – Vung Tau.

There are two kinds of cages: Cage with wooden frame with the size of 3 x 3 x3 m or 5 x 5 x 5 m, this is the most popular cage in most provinces. Norwegian styled cage (products of Vietnam) is popular in Nghe An, Vung Tau with plastic frame, which can stand out 9-10 level wind and waves.

2.2.3. Pond culture,

Mariculture in pond has been developed since 2002-2003 in some Northern and Central provinces. Fish species for this type of culture are *Epinephelus coioides, Lates calcarifer, Psammoperca waigensis, Sparus sarba, Scyaenops ocellatus*. Production is average of 12-13 tons/year.

2.3. Current status other problems of mariculture

- Seeds: Now Vietnam has been just managed for technology of reproduction seeds 5 species but with experimented scale at institutes so quantity seeds not much and high prices. Famings usually use source seeds wild and import from Taiwan, China.
- Culture: Now Vietnam developing culture in close bays at coastal which small waves and wind by small cages of household. For this reason, market production not concentrate and

live production is mainly. Almost household use trashfish that is food for mariculture so not managed source food and effect negative for culture environment. Pollution environment at culture areas was critical due to cage density on the sea is too high and not master plan. Cage culture at open sea is not developed due to high investment and market of fish mariculture unstable market.

- Disease appeared usually due to high culture density, quality of seeds is bad. Technology product vaccine have just started research. However, this vaccine problem is being difficult for mariculture because can't have any vaccine kind for all of species fish and all of disease. For this reason, quality of seeds, mariculture environment and methods prevent disease must interest on the top.
- Transfer technology started from 2004 to 2005. Due to difficult technology, high risk and depend on many sectors that farmer can't invest money to buy technology from institutes. Therefore, still has long distant between technology from institutes to farmer.
- Mariculture developed to bring to thousand household transfer coastal fishing to mariculture. In future, mariculture include cage culture, pond culture, polyculture 1 shrimp crop per 1 fish crop ... will be make works for farmers and poverty reduction. However, that problems should interest of quality environment of body water in order to sustainable development.

3. Strategy development in the future

Until 2010, Vietnam wish to achieve 200.000tons fish mariculture per year. For so this target, 2006 - 2010 stage base on the current development, natural condition, eco-social condition, investment, technology and market we realize that strategy development in Vietnam as following:

1. Seed reproduction

- Seed is first condition play a role important. Shall hasten development of technology seed reproduction and transfer technology for hatcheries. Transferable should carry out step by step technology.

-To research reproduction technology must on base motto culture multi species main point. Preferential right for species fish that its have high consumable market, can produce frozen (Red drum, sea carp, ca trap) and fish low food Chain group (*Siganus, milkfish, mullet,* …).

- Must be manage and control broodstock quality for high value species. Expand in to research increase genetic quality of parental fishes.

- Expand in to study on reproduction high quality seeds and SPF seeds, apply vaccine prevent for some species that are decisive object.

- Salvage hatcheries unactive or active less effect for rearing in order to increase effect this hatcheries and make seeds with high quantity.

2. Commercial mariculture

- Local should hasten mater plan process areas mariculture for marine fish, molusca and give specific policies and methods for development mariculture, shouldn't concentrate cages, areas culture at one place.

-Research new technology culture, high productivity, security product will rapid expand. Produce and use float foods being encourage in order reduce using trashfish. Other side, reduce rate fish powder in pellets.

- Research to develop fish species use pellets feed, could culture cage, pond that its make high production for fresh frozen or fillet as: red snaper, mangrove snaper, red drum, sea bream, ...

- Develop to culture multi-species, develop cage culture in close bays, cage culture in semi-close bays and ponds culture. Develop to culture marine fish at lands far away from coastal and open sea was being priority. Firstly, will hasten to culture marine fish in pond. Use ponds culture shrimp regressing for culture marine fish on order to make export product and improve environment ponds. Hasten poly-culture in areas shrimp culture in order to reduce disease for shrimp and raise effect use land and take part in to restrain regression environment.

- Intensify cooperative with Asean countries and other countries for learn, exchange experience seed reproduction and marine culture fish, prevent disease in order to rapid development and sustainable mariculture.

Reference

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