

**DEPARTMENT OF FISHERIES  
THUA THIEN HUE PROVINCE**  
THE FISHERIES EXTENSION CENTRE OF THUA THIEN HUE PROVINCE  
(FEC)

**REPORT ON THE RESULTS OF  
THE PILOT MODEL IMPLEMENTATION NAMELY  
THE HARD CLAM CULTURE**

*Venue:* Quang Phuoc commune, Quang Dien district, Thua Thien Hue province  
*Sponsored by:* IMOLA Hue  
*Affiliation:* Fisheries Extension of Thua Thien Hue province  
*Extensionist:* Pham Quang Anh Khoi  
Nguyen Thi Thu Giang

*Hue, November 10<sup>th</sup>, 2007*

**REPORT ON THE OUTCOMES  
OF THE PILOT MODEL CONDUCTION**

**“Hard clam culture in the earthen pond”**

**Kind attention:**

- Director of the Fisheries Extension Centre of Thua Thien Hue province
- IMOLA project

**We include** Pham Quang Anh Khoi and Nguyen Thi Thu Giang

According to the schedule for the model execution in 2007 jointly by FEC of Thua Thien Hue province and IMOLA project, the model for the commercial clam culture was funded by IMOLA and executed in Mai Duong village, Quang Phuoc commune, Quang Dien district. Another clam culture model was also conducted in Phu Xuan commune, Phu Vang district. So far, the process has come to an end and we would like to include herewith the outputs of the pilot model:

## **Part 1: BRIEF REPORT**

### **1. Venue and scale:**

<b>No.</b>	<b>Household</b>	<b>Venue</b>	<b>Area (m<sup>2</sup>)</b>	<b>Budget</b>	<b>Project proponent</b>
1	Nguyen Hoa <b>(Pond 1)</b>	Mai Duong village, Quang Phuoc commune, Quang Dien district	5,000	IMOLA project	Pham Quang Anh Khoi Nguyen Thi Thu Giang
2	Tran Mang <b>(Pond 2)</b>	Le Binh village, Phu Xuan commune, Phu Vang district	7,500	National FEC	Chau Ngoc Phi

### **2. Objective:**

- Testing the hard clam culture in the contaminated low-tide ponds to replace inefficient tiger shrimp farming culture areas;
- Improving the polluted environmental condition and expanding the culture in the sustainable way.
- Identifying the economic value of hard clam culture to expand the culture and increase the income for the lagoon dwellers.
- Diversifying the brackish water and saline species for the aquaculture, contributing to improving the physical life for the people.

### **3. Results based on certain criteria compared with the draft:**

<b>NO.</b>	<b>CRITERIA</b>	<b>UNIT</b>	<b>QUANG DIEN</b>		<b>PHU VANG</b>
			<b>Expected</b>	<b>In practice</b>	<b>Completed</b>
1.	Area	m <sup>2</sup>	5,000	5,000	7,500
2.	Farming period	Month	6	5.5	4.5
3.	Density	Unit /m <sup>2</sup>	100	100	30
4.	Fingerling size	Unit /kg		210	210
5.	Stocking quantity	Units	500,000	500,000	225,000
6.	Survival rate	%	50	55	70
7.	Size at harvest time	g/ unit	20	13	14
8.	Economic value			Loss: 7,550,000	Profit: 6,838,000

#### **4. Some lesson learnt and conclusions from the pilot:**

- Implementation plan: The pilot was executed according to the plan.
- Environmental improvement feasibility:

The hard clam has capacity of filtering 20 liters of water/ one whole day (from 0.2-0.25 g of organic humus, carcass of algae and other discharges). This proves that clam is the suitable cultured species to improve the lagoon environmental condition.

- + The habitation in Phu Xuan commune is quite suitable for the growth and development of the hard clam.
- + The habitation of hard clam culture in Quang Dien district is unsuitable for the hard clam growth.
- + The ability of improving the hard clam is better than some other filtering species based on some parameters including PO<sub>4</sub>, NH<sub>3</sub>, NO<sub>3</sub> which are gradually improved.

- **Stocking density:** as planned, the stocking density of 100 units/ m<sup>2</sup> was too high for the locally environmental condition. For that reason, the adopted density of 30 units/ m<sup>2</sup> in Quang Dien district was suitable while in Phu Vang district it should not be 50 units/ m<sup>2</sup>.

#### **- Growth speed:**

- + The habitation in Phu Xuan was quite suitable for the growth and development of the hard clam with the average weight of 72 units/ kg.
- + The environmental condition in Quang Dien district was inappropriate for the growth and development of hard clam. The average weight was 75 units/kg; the clam shells became darker and darker after 1.5 month of culture.

#### **- Economic value:**

The duration for the pilot models is 5.5 months (June-December) and 4.5 months (between July 2<sup>nd</sup>, 2007 and April 10<sup>th</sup> 2007) for Quang Phuoc and Phu Xuan, respectively. High investment cost, meticulous fingerling transport and selection resulted in the inefficient productivity and low economic effectiveness although no feed involvement was required except for the monitoring efforts. While the pilot model in Quang Phuoc commune produced no profit, the one in Phu Xuan commune gained a profit of 6,838,000 VND/1ha for 4.5 culture months.

#### **- Expansion feasibility:**

Given the unstable consumption market in Thua Thien Hue, low product price, imported clams from other provinces with high price, fingerlings and market should be the matters of concern to expand the model.

Hard clam cultured in the low-tide area with the mud bottom faced the high risk of loss. The dark color did not attract customer interest. For this reason, the model should not be expanded in the region.

Some other culture areas in the province with the sandy bottom and under the influence of the wide tidal range such as communes under Phu Vang and Phu Loc districts are suitable for the model expansion.

## CONCLUSIONS AND PROPOSALS

### 1. Conclusion:

Some conclusions can be drawn from the conduction of this pilot model for the hard clam culture:

- The culture of Ben Tre hard clam in the low-tide area with the muddy or sandy bottom and low salinity range in Quang Phuoc commune did not bring about the economic efficiency.

Regarding the low-tide areas with the sandy or muddy bottoms and stable salinity (> 10 ‰), the implementation of the model achieved some positive results such as in Phu Xuan commune, Phu Vang district.

- For the natural condition of Thua Thien Hue province, the stocking of big-size hard clams (150-200 units/ kg) was appropriate. The culture density ranged from 30-50 units/m<sup>2</sup>, dependant on the salinity range, bottom characters and currents (In areas with the muddy or sandy-muddy bottom and stable salinity, the stocking density was higher than 50 units/ m<sup>2</sup>).

- Growth speed: The hard clam grew smoothly at the beginning stage. However, when the salinity reduced and this situation extended the hard clam delayed in growing and faced a high loss risk. In addition, under the mixture of muddy and sandy bottom, the hard clam color doesn't change as much as the cultured in the muddy-bottom ponds in Quang Phuoc commune.

### 2. Proposals:

- At present, the clam breeding source in Thua Thien Hue is not available and therefore purchased from other provinces. We propose the relevant organizations to make considerations and have the supportive measures (e.g., offering fingerlings) so that the pilot model can be expanded in some communes where the salinity is stable and the pond bottom is sandy.

- There should be the encouragement policies to establish purchasing and processing groups and exporters so that the products will be easily consumed and the price will be insured.

- As this is the first hard clam to be piloted in Thua Thien Hue province, the evaluation upshot can not be thoroughly exact. We proposed the FEC and IMOLA project to create the favorable conditions for the pilot model expansion.

**PART II: MAJOR CONTENT**  
**OUTCOMES OF THE PILOT MODEL**

**I. PREFACE:**

Over the past years, the tiger prawn culture has become the major species in fisheries exportation and had a good competitiveness in the global market. Nevertheless, shrimp farmers are encountering more and more obstacles including the wide-spread diseases and poor quality water, which inserts adverse impacts on the tiger prawn farming. Many fish farmers encounter interminable loss and can not return debts to the banks, especially those in low-tide region surround the lagoon.

The diversification of the cultured species is an important solution in aquaculture to find the new high-economic species to gradually replace low-yield and vulnerable-to-disease species to minimize the economic loss to the people.

To get over the above-mentioned situations, the investigation and application of some various cultured species that are capable to improve the bottom and water condition and bring about the economic efficiency, helping to minimize the organic pollution appearing on the low-tide area.

The ponds located on the outer areas are normally abandoned. This is the matter of urgent concern for the fisheries sector.

For that reason, the model of piloting clam culture was conducted in the low-tide contaminated and abandoned ponds in Thua Thien Hue province, contributing to diversifying the cultured brackish water species and meeting the demand of the customers, bringing more job opportunities to improve the economic life for the people.

## **GENERAL INFORMATION ABOUT THE MODEL**

**1. Pilot name:** Ben Tre hard clam culture in the earthen pond

**2. Duration:** 3/2007-11/2007

**3. In-charge affiliation:** FEC of Thua Thien Hue province

**4. Monitoring and collaborative organizations:**

- IMOLA project
- Division of Agriculture and Rural development of Quang Dien district.
- Division of Agriculture and Rural development of Phu Vang district.

**5. Sponsors:**

- National FEC sponsored the model execution in Phu Xuan commune
- IMOLA-Hue project sponsored the model conduction in Quang Phuoc commune

**Total budget:** *(with attached budgetary table)*

Total budget: **69,520000 đ**

In details:

- FEC contribution: 21,590,000 VND (direct support to the pilot model 20,000,000 VND)
- IMOLA support: 15,770,000 VND
- Local contribution: 32,160,000 VND

**6. Objective:**

- Testing the hard clam culture in the contaminated low-tide ponds to replace inefficient tiger shrimp farming culture areas;
- Improving the polluted environmental condition and expanding the culture in the sustainable way.
- Identifying the economic value of hard clam culture to expand the culture and increase the income for the lagoon dwellers.
- Diversifying the brackish water and saline species for the aquaculture.

**7. Beneficial household:**

- Direct beneficial household: 1 household
- Indirect beneficial household: through the technical training and experience sharing with the direct beneficial household in Quang Phuoc commune.

## **III. ORGANIZATION AND RESULTS:**

**1. Requirements:**

- Identify the cultured species that are adaptable to the environmental condition in the local area to bring about the economic efficiency and simultaneously improve the environmental condition and gradually substitute the ineffective tiger prawn in the contaminated low-tide area.

**2. Time and methodology:**

**2.1. Time:**

NO.	DURATION	ACTIVITY
1	10/3 - 20/4/2007	Household and venue selection
2	2/6/07-15/11/2007 2/7/07- 14/11/07	Fingerling stocking, culture and harvest (Quang Dien) Fingerling stocking, culture and harvest (Phu vang)
4	12/2007	Checking and writing reports

## 2.2. Methodology:

- Investigating and making survey of the environmental and natural conditions and the characters of the area where to conduct the model.
- Monitoring the environmental factors during the culture process and identifying parameters including pH, KH, NO<sub>3</sub>, PO<sub>4</sub>, S<sup>0</sup>/<sub>00</sub>, NH<sub>3</sub> to understand the capacity for the environmental condition improvement of the hard clam.
- Monitoring clam growth and development speeds, periodically 10-15 days, catching clams to measure the length and weight.
- Monitoring the pond everyday and dive to find the dead clam shells to ascertain the survival rate.

## 3. Technological process:

### 3.1. *Filtering capacity of the clam according to the theoretical test:*

- Theoretically, the hard clam has capacity of filtering 20 liters of water/ one whole day (from 0.2-0.25 g of organic humus, carcass of algae and other discharges). This proves that clam is the right cultured species to improve the lagoon environmental condition.

### 3.2. Pond condition:

#### a. Farming pond:

- Selecting abandoned pond for a long period or badly damaged ones with the muddy and sandy bottom.
- Farming pond: each pond has the area of 5,000 m<sup>2</sup>, in the low-tide area pond and the water exchange depends thoroughly on the tide.
- The farming area has the stable salinity and the depth of > 1.2 m.

#### b. Pond preparation:

- Clearing was made on the pond dykes; algae were collected and one net layer of 50 cm at the bottom floor was fenced to minimize the removal of clam out of the pond.
- The sewage was opened to take the water according to the tide.

### 3.3. Fingerling selection and stocking.

- The clam was selected with the length of over 1.5 cm with the uninjured shell. With the sufficient interior organs, the weight of the clam can be recognizable when held high.

- The clam was stocked in the morning and late afternoon; temperature should be maintained between 22-25 °C during the transportation. The clams were put in plastic bags with the sparse net mesh size to enable the air exchange. The long duration was avoided so that the clam was not insufficient for the oxygen. Water was sprayed into the clams every 1-2 hours.

### 3.4. Monitoring the environmental parameters:

7 days periodically, environmental parameters including pH, kH, S (‰), PO<sub>4</sub>, NH<sub>3</sub> and NO<sub>3</sub> were measured and enlisted on the monitoring table to improve the water condition.

### 3.5. Monitoring the survival rate, growth and development speed:

Every 7-10 days, dive into the pond to check loss rate, weight and measure the weight and length of clam. Farmers should have the record keeping books to take notes of the growth speed of the clam over the months so that they can compare with the culture in other areas.

## 4. Results:

### 4.1. Fingerling density and stocking:

Table 1: Fingerling stocking table

<b>Stocking density</b>	<b>Density (con/m<sup>2</sup>)</b>	<b>Venue</b>	<b>Quantity (units)</b>	<b>Total (units)</b>
2/6/07	100	Pond 1 (Quang Dien)	500,000	<b>500,000</b>
2/7/07	30	Pond 2 (Phu Vang)	225,000	<b>225,000</b>

#### 4.2. Monitoring environmental parameters:

Table 2:

Monitoring environmental parameters during the culture period.

Date	Household: Mr. Phan Hoa (Quang Dien)						Household: Mr. Tran Mang ( Phu Vang)					
	pH	KH	S (‰)	PO <sub>4</sub>	NH <sub>3</sub>	NO <sub>3</sub>	pH	KH	S (‰)	PO <sub>4</sub>	NH <sub>3</sub>	NO <sub>3</sub>
2/6/07	7.8	85	12.0	0.25	0.05	0.1	8.0	82	19	0.25	0.03	0
4/6/07	8.0	65	9	0.25	0.03	0.1	8.2	85	18	0.2	0.01	0
14/6/07	8.2	65	9	0.18	0.03	0.1	8.0	82	17	0.2	0	0
20/6/07	8.0	60	9	0.18	0.03	0.1	8.0	90	20	0.2	0	0
27/6/07	8.0	72	11	0.15	0.02	0	8.0	72	21	0.1	0	0
2/7/07	8.0	70	9	0.15	0.02	0	8.0	81.5	23	0.1	0	0
12/7/07	8.0	70	15	0.12	0.02	0	8.0	82	22	0.1	0	0
16/7/07	8.0	70	18	0.12	0.01	0	7.9	72.5	22	0.1	0	0
23/7/07	7.9	75	22	0.12	0.01	0	8	82	20	0.1	0	0
6/8/07	6.8	70	3	0.18	0.05	0.1	7.8	72	19	0.12	0.01	0
Date	Household: Mr. Phan Hoa (Quang Dien)						Household: Mr. Tran Mang ( Phu Vang)					
	pH	KH	S (‰)	PO <sub>4</sub>	NH <sub>3</sub>	NO <sub>3</sub>	pH	KH	S (‰)	PO <sub>4</sub>	NH <sub>3</sub>	NO <sub>3</sub>
15/8/07	7.6	65	15	0.15	0.02	0	7.6	82	22	0.1	0	0
20/8/07	7.2	68	13	0.1	0.01	0	7.2	88	19	0	0	0
30/8/07	7.7	65	12	0.1	0.00	0	7.7	90	19	0	0	0
5/9/07	7.7	60	11	0.1	0.00	0	7.6	80	19	0	0	0
10/9/07	7.5	55	9	0.1	0.00	0	7.5	72	19	0	0	0
20/9/07	7.5	60	12	0.1	0.00	0	8.2	80	22	0	0	0
27/9/07	7.6	72	12	0.1	0.00	0	8.0	82	23	0	0	0
4/10/07	6.2	50	2	0.15	0.05	0.1	7.5	70	7	0.1	0.01	0.1
11/10/07	6.7	50	4	0.12	0.03	0.1						
18/10/07	6.6	50	3	0.1	0.03	0.1						
25/10/07	6.5	45	3	0.1	0.04	0.1						
2/11/07	6.2	40	3	0.1	0.03	0.1						
9/11/07	6.0	40	2	0.1	0.03	0.1						

### **Comments:**

As can be seen from the results on the environmental parameters on Table 2, the environmental improvement of the clam was better than other filtering species based on the parameters including PO<sub>4</sub>, NH<sub>3</sub>, NO<sub>3</sub>, which were gradually upgraded during the culture period.

However, in Quang Dien district, clam usually inhabited at the depth of over 1 m. The water range was 1.1 – 1.5 m, with the muddy bottom. Additionally, the area was usually influenced by the long-lasting fresh water intrusion. Clams had to bury themselves deep in the mud, which lead to the darkening of the clam shell and high loss rate.

In Phu Vang district, environmental parameters did not change much. The salinity was stable between 15-23 ‰ except for that during the influence of the storm 2 and 5. The bottom matters were the mixture of mud and sand. Other environmental parameters lay within the allowable limit. For that reason, the clam shell was clean enough and the meat is of better quality compared with that in Quang Dien district.

Over the culture period, the amount of organic matters in the pond was improved, outstandingly could be seen on NH<sub>3</sub>. However, floods caused by the storm 2 and 5 increase the NH<sub>3</sub> parameters. This proves the improvement capacity of the clam.

### **4.3. Checking the clam growth during the culture period:**

DATE	TLS (%)		WEIGHT (UNITS/KG)		EXPECTED PRODUCTIVITY (KG)	
	Quang Dien	Phu Vang	Quang Dien	Phu Vang	Quang Dien	Phu Vang
2/6/07	100		220		2,273	
4/6/07	90		220		2,045	
14/6/07	80		200		2,000	
20/6/07	80		183		2,186	
27/6/07	78		170		2,294	
2/7/07	75	100	162	216	2,315	1,042
12/7/07	75	90	145	197	2,586	1,028
16/7/07	75	85	137	187	2,737	1,023
23/7/07	75	85	122	168	3,073	1,138
6/8/07	68	78	118	155	2,881	1,132
15/8/07	67	78	116	150	2,888	1,170
20/8/07	67	75	113	137	2,964	1,232
30/8/07	66	75	108	122	3,055	1,383
5/9/07	66	75	103	112	3,203	1,507
10/9/07	66	75	100	100	3,300	1,688
20/9/07	66	75	83	83	3,976	2,033
27/9/07	65	75	77	72	4,220	2,344
4/10/07	60	70	75	72	4,000	2,188

**Comment:**

From the results of the hard Ben Tre clam culture in Quang Phuoc commune, Quang Dien district and Phu Xuan commune, Phu Vang district of Thua Thien Hue province, the following results can be portrayed:

+ The ability of improving the hard clam was better than some other filtering species based on some measured parameters including PO<sub>4</sub>, NH<sub>3</sub>, NO<sub>3</sub> which were gradually improved.

+ At the beginning stage, the clam grew fast, improving the pond culture shown through parameters including PO<sub>4</sub>, NH<sub>3</sub>, NO<sub>3</sub>, which tended to decline gradually during the farming period.

The inhabitation condition of Phu Vang was quite suitable for the growth and development of hard clam. The survival rate reached 70% and the average weight was 72 units/ kilo. In addition, the bottom characters of this area included the mixture of sand and mud. The clam had the time to be disposed to the sun, which was the reason why they brought about the high economic efficiency.

The environmental condition in Quang Dien was less appropriate for the growth and development of the hard clam. The survival rate only reached 55%, the average weight was 75 units/ kilo. In addition, this area was sandy and muddy; the clam was hardly disposed to the sun so the color turned black and resulted in the low economic efficacy.

On October 1<sup>st</sup>, 2007, we had to harvest earlier than the schedule because of the influence of the fifth storm. However, we had moved 10 % (675 kilos) of clams to another place to continue monitoring.

The total productivity table showed the hard clam weight after the clams was moved to another place.

<b>Date</b>	<b>Total productivity (%)</b>	<b>Weight (units/kg)</b>	<b>Tentative productivity (kg)</b>
11/10/07	10	74	675
18/10/07	8	73	548
25/10/07	8	72	555
2/11/07	7	71	490
9/11/07	5	70	357

Between October and November, flood happened so frequently that the hard clam delayed growing and faced high percentage of loss.

## 6. Results:

### Estimated harvested products

No.	Venue	Pond name	Survival rate (%)	Fingerling size (unit/kg)	Productivity (kg)
1	Quang Dien	Pond 1	50	75	3,300
		Remaining	5	70	357
2	Phu Vang	Pond 2	70 %	72	2,188

### 7. Some conclusions and lessons learnt from the model:

- Implementation schedule: The pilot was conducted as stated in the requirements in the draft plan.

#### - Environmental condition improvement

+ The inhabitation condition of Phu Vang is quite suitable for the growth and development of hard clam.

+ The environmental condition in Quang Dien is less appropriate for the growth and development of the hard clam.

+ The ability of improving the hard clam is better than some other filtering species based on some parameters including PO<sub>4</sub>, NH<sub>3</sub>, NO<sub>3</sub> which are gradually improved.

- **Stocking density:** as planned, the stocking density was 100 units/ m<sup>2</sup> that was too high for the local environmental condition. For this reason, it was perceivable that in Quang Dien district, the stocking density of 30 units/ m<sup>2</sup> is appropriate. In the meanwhile, the density should not be over 50 units/ m<sup>2</sup> in Phu Vang district.

#### - Growth speed:

+ The habitation in Phu Xuan is quite suitable for the growth and development of the hard clam with the average weight of 72 units/ kg.

+ The environmental condition in Quang Dien district is inappropriate for the growth and development of hard clam. The average weight was 75 units/ kg

#### - Economic efficiency:

5.5 months (June-December) and 9 months (between April 2<sup>nd</sup> 2007 and November 2<sup>nd</sup> 2007) for Quang Dien and Phu Vang, respectively after the culture time, high investment cost, meticulous fingerling transport and selection resulted in the inefficient productivity and low economic effectiveness although no feed involvement was required except for the monitoring efforts. While the pilot model in Quang Phuoc commune produced no profit, the one in Phu Xuan commune gained a profit of 6,838,000 VND/1ha for 4.5 culture months.

### - Expansion possibility:

Given the unstable consumption market in Thua Thien Hue, low product price, imported clams from other provinces with high price, fingerlings and market should be the matters of concern to spread out the model.

Hard clam cultured in the low-tide area with the mud bottom face the high risk of loss. The dark color did not attract customer interest (Quang Phuoc commune, Quang Dien district).

In the meanwhile, although the economic efficiency from the model was not high, the aforesaid reasons could be recovered, commented by the technical staffs and the local authority. The culture of hard clam until this moment has brought about the positive effects (including the good growth speed, high survival rate and no involvement in the feed investment and improving the environmental condition).

Other culture areas in the province with the sandy bottom or alluvial zones, the clam developed well; the survival rate was high; the quality of hard clam did not meet the market demand. The culture of hard clam could be expanded if the market demand is good.

### 8. Evaluation of the reasons leading to the low economic efficiency:

- Costly fingerlings, high investment involved
- Deep water leading to lots of labor requirement
- Dark shell, low cost
- Wide-changing market and high loss risk

### 9. Budget involved during the implementation:

#### **Direct budget:**

##### **- Quang Dien district**

Fingerling purchase: 500,000 units x 100 VND/unit = 50,000,000 VND

Care-taking labor: = 1,200,000 VND

Equipment for testing the water and chemicals:

= 1,200,000 VND

**Total: = 52,400,000 VND**

##### **- Phu Vang district:**

Fingerling purchase: 225,000 units x 100 VND/ unit = 22,500,000 VND

Care taking labor: = 1,200,000 VND

**Total: = 23,700,000 VND**

## 10. Economic accounting:

No.	Items	Unit	Criteria
1	- Productivity: (Quang Dien) + First time: + Second time: - Productivity (Phu Vang)	Kilo Kilo Kilo	<b>3,657</b> 3,300 357 2,188
2	- Revenue in Quang Dien: 3,300 kilos x 12,500 VND/kilo 357 kilos x 10,100 VND/ kilo - Revenue in Phu Vang 2,188 kilos x 13,500 VND/ kilo	VND VND VND	<b>44.850.000</b> 41,250,000 3,600,000 29,538,000
3	Profit: Revenue - Expenditure: - Quang Dien 44,850,000 VND – 52,400,000 VND - Phu Vang 29,538,000 VND x 22,700,000 VND	VND VND	<b>-(7,550,000)</b> <b>+ 6838,000</b>

## 11. Scientific, technical and socio-economic meaning of the pilot:

- Improvement of the pond bottom that is impossible for shrimp culture.
- Taking advantage of the abandoned ponds in the low-tide area
- Diversification of the cultured species

## IV. CONCLUSION AND PROPOSALS:

### 1. Conclusion:

Some conclusions can be drawn from the conduction of this hard clam pilot model:

- The culture of Ben Tre hard clam in the low-tide area with the muddy or sandy bottom and low salinity range in Quang Phuoc commune did not bring about the economic efficiency.

Regarding the low-tide areas with the sandy or muddy bottoms and stable salinity (> 10 ‰), the implementation of the model achieved some positive results such as in Phu Xuan commune, Phu Vang district.

- For the natural condition of Thua Thien Hue province, the stocking of big-size hard clams (150-200 units/ kg) was appropriate. The culture density ranged from 30-50 units/m<sup>2</sup> dependant on the salinity range, bottom characters and currents (In areas with the muddy or sandy-muddy bottom, the stocking density should be less than 30 units/ m<sup>2</sup> while it should be over 50 units/ m<sup>2</sup> in areas with the sandy and muddy bottom and stable salinity).

- Growth speed: The hard clam grew smoothly at the beginning stage. However, when the salinity reduced and extended the hard clam delayed in growing and faced a high loss risk. In addition, under the mixture of muddy and sandy bottom, the hard clam color doesn't change as much as the cultured in the muddy-bottom ponds in Quang Phuoc commune.

## **2. Proposals:**

- At present, the clam breeding source in Thua Thien Hue is not available and therefore purchased from other provinces. We propose the relevant organizations to make considerations and have the supportive measures (e.g, offering fingerlings) so that the pilot model can be expanded in some communes where the salinity is stable and the pond bottom is sandy.

- There should be the encouragement policies to establish purchasing and processing groups and exporters so that the products will be easily consumed and the price will be insured.

- As this is the first hard clam to be piloted in Thua Thien Hue province, the evaluation upshot can not be thoroughly exact. We proposed the FEC and IMOLA project to create the favorable conditions for the pilot model expansion.

**Director of the FEC**

**Written by:**

**Nguyen Thi Thu Giang**