



# INTEGRATED MANAGEMENT OF LAGOON ACTIVITIES IMOLA PROJECT

REPORT ON

# ON-SITE TRAINING NEEDS ASSESSMENT

July 2006



PEOPLE'S COMMITTEE OF THUA THIEN HUE PROVINCE



**INTEGRATED MANAGEMENT OF LAGOON ACTIVITIES - IMOLA  
THUA THIEN HUE, VIET NAM  
(FAO/IMOLA/DOFI, GCP/VIE/029/ITA)**

**On-Site Training Needs Assessment Report**



**Food and Agriculture  
Organization of the United  
Nations**  
**Thua Thien Hue Province**  
**July 2006**



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This On-Site TNA Report is written and compiled by **Md. Ghulam Kibria (FAO TCDC Fisheries & Aquaculture Extension Consultant)** in close cooperation, consultation and assistance with **Arie Pieter van Duijn (Socio-Economist – Fisheries, FAO/IMOLA)** and gratefully acknowledged to four team members of this TNA study.

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## **Abbreviations, acronyms**

CTA	Chief Technical Adviser
CPC's	Commune People's Committee's
CPUE	Catch per Unit Effort
CSSH	The Center of Social sciences and Humanity – Hue University
DACUM	Developing a Curriculum methodology
DARD	Department of Agriculture and Rural Development
DOFI	Department of Fisheries (provincial)
DPI	Department of Planning and Investment
FAO	Food & Agriculture Organization of UN
FEC	Fisheries Extension Centre (provincial)
HUAF	Hue University of Agriculture & Forestry
HA	Hectare
IMOLA	Integrated Management of Lagoon Activities
MOFI	Ministry of Fisheries
NPD	National Project Director
INGO	International Non-Government Organisation
PRA	Participatory Rural Appraisal
PMO	Project management office
PPC	Provincial People's Committee
QS	Questionnaire Survey
SLA	Sustainable Livelihoods Analysis
SAPA	Sustainable Aquaculture for Poverty Alleviation
TNI	Training Need Identification
TNA	Training Need Assessment
TTH	Thua Thien Hue
TOR	Terms of Reference

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THUA THIEN HUE, VIET NAM**

(FAO/IMOLA/DOFI, GCP/VIE/029/ITA)

**ON-SITE TNA REPORT**

(3-5/5/2006 and 5-7/7/2006)

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## **1 BACKGROUND**

1. The Government of Vietnam and the Provincial People's Committee of Thua Thien Hue province, located in central Vietnam requested technical assistance from the Food and Agriculture Organization of the United Nations (FAO) in the sustainable management of the aquatic resources of Tam Giang Lagoon. With financial support from the Italian Government the FAO started implementation of a project aimed at improving the livelihoods of the people dependent on the Tam Giang Lagoon by promoting a participatory sustainable management of the hydro-biological resources in the lagoons, in accordance with the socio-economic and production systems requirements of the population and with particular emphasis on the gender roles, the achievement of food security and the alleviation of poverty. The project is entitled "Integrated Management of Lagoon Activities in Thua Thien Hue province" IMOLA-Hue project (GCP/VIE/029/ITA).
2. The immediate objectives of the project are: 1) To understand the present issues in the lagoon, with respect to the hydro-biological resources status and use, human activities, current institutional responsibilities and management practices; 2) Based on the sustainable use of natural resources within the lagoon, to identify priority issues in an effort to support the existing, and develop new, management policies in order to improve people's livelihoods and reduce risks for poorer people who are dependent on the lagoon resources. These policies should be developed in a participatory way resulting in a draft Lagoon Management Plan which will provide, in a gender sensitive way, special attention to poverty alleviation amongst landless and lagoon communities; 3) To prepare for the implementation of the Management Plan, including preparation of the official enactment of the plan, implementing strategy at all levels, capacity building, as well as identification of credit, savings, insurance and organizational needs and investment requirements; 4) To strengthen the provincial institutional capacity in such a way that the Management Plan, once approved, will be implemented actively according to the strategies formulated and that the provincial institutions are able to formulate and implement policies related to the management of the lagoon system that are environmentally and socially sustainable; finally 5) To disseminate the findings and results of the project on a national and international basis, so that others may use this example in their formulation of Management Plans. By disseminating the knowledge gained it would most probably attract the interest of donors and government agencies for similar plans in other provinces in Viet Nam.
3. The Project started its activities in August 2005, and organized its kick-off workshop in September 2005. The 1<sup>st</sup> TNI was held in Dien Hai commune, Phong Dien District, on January 19 and 20, 2006. This TNI was followed by a PRA & SLA in 6 communes, from February 27 to March 3 and a questionnaire survey in 11 communes from March 20 to March 28, 2006. Finally two On-Site TNA surveys were carried out in 11 communes (*see table*) from May 3-5, and July 5-7, 2006 respectively. These two TNA surveys were followed by On-site TNA Framework (*Annex 1*).

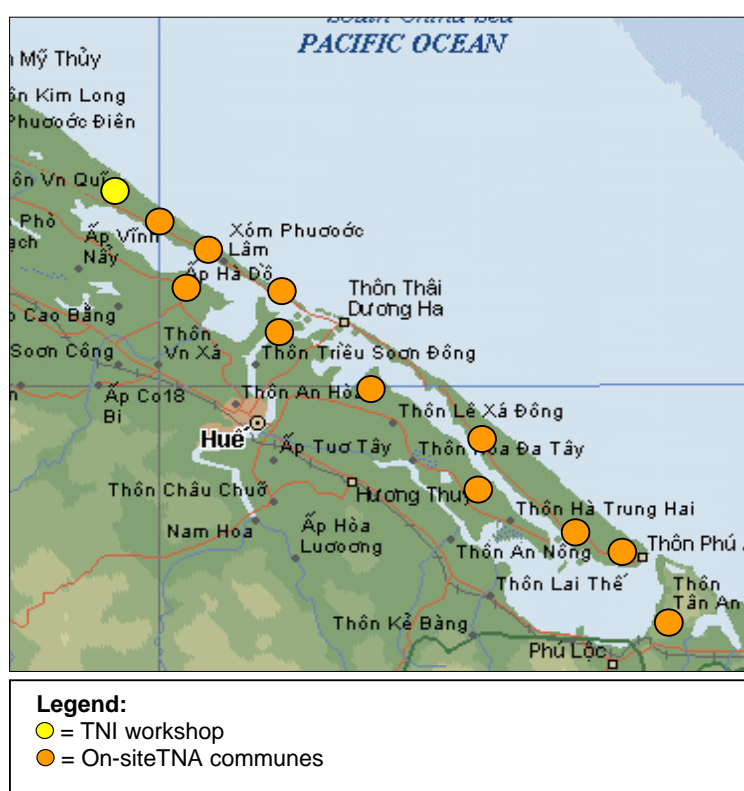
4. The purpose of On-Site TNA was to gather the necessary information to be used in combination with the outcomes of the preceding field activities mentioned above to design a suitable training programme that will enable IMOLA to provide appropriate hands-on training to the right people at the right place at the right time. During the preceding field activities, regional as well as local variations in the natural environment and the socio-economic status of households were identified. IMOLA seeks to understand the relationship between these identified variations and the immediate training needs of lagoon community. It is expected that the prevailing local conditions will have a definite impact on lagoon activities and in effect cause a local as well as regional variation in the actual training needs.
5. The following activities were investigated more closely during the course of the On-site TNA surveys:
  - A. Aquaculture**
    - Pond culture
    - Cage culture
    - Net enclosure
    - Mollusc culture
  - B. Capture fisheries**
    - Stake traps
    - Bottom nets
    - Gill nets & Trammel nets
6. When working in a specific commune the following natural and environmental characteristics are taken into consideration:
  - Lagoon
  - High tide / low tide (converted paddy fields / lagoon)
  - Muddy soil / sandy soil
  - Fresh water / brackish water / salt water
7. Commune selection: Since it was necessary to carry out the TNA on a relatively short notice the focus was on the selection of communes from the 15 that IMOLA has already worked in. The main criteria for selection of communes to carry out the TNA were a mix of habitats and generally successful and less successful areas. This resulted in the selection of the following 11 communes.

<b>Commune name</b>	
Quang Ngan	Vinh Xuan
Quang Cong	Vinh Phu
Quang Phuoc	Vinh Hung
Hai Duong	Vinh Hien
Huong Phong	Loc Binh
Phu Xuan	

Depending on either how widespread a particular activity is or how sensitive a particular activity is to changes in natural environmental characteristics some activities

were targeted more frequently than others. One other activity that was initially not included in the plan was later added, namely net enclosure.

Activity	Number of assessments (planned)
Pond culture	10
Cage culture	4
Mollusc culture	2
Stake traps/Fish corral	3
Bottom nets	3
Gill nets/Trammel net	3



8. Selection of participants. When requesting the CPC's of the selected communes to select suitable participants the following characteristics were taken into consideration:
  - Poor / successful
  - Men / Women
  - Sampan people
  
9. During 2 times 3 days a total number of 25 (20 + 5) TNA meetings were held in 25 villages in 11 communes. The complete TNA survey was attended by a total number of 215 aquaculture farmers and fisherfolk. The gender ratio was about 2:1 in favour of men (Male 66% and Female 34%) and the age range was from 22-83. After four teams conducted the first 20 TNA's a further 5 were carried out to complete and validate the data necessary to finalize the TNA report. The TNA framework appears in *Annex 1*. The programme and composition of the five teams that carried out in the TNA can be found in *Annex 4 & 3* respectively.

## 2 ANALYSIS OF FINDINGS

The individual notes from the field teams were compiled, analysed and summarized as hereunder under seven major activities. The TNA surveys were mainly focused on 7 major activities (Aquaculture: Pond culture, Cage culture, Net enclosure, Mollusc culture and Capture fisheries: Stake traps, Bottom nets and Gill nets & Trammel nets) but a general and urgent need for alternative livelihood opportunities has been identified in this process. This need appears to be crosscutting all present activities and all communes around the lagoon. Local people expect that vocational training will create alternative livelihood opportunities and reduce the exploitation intensity. They say that all project communes have a good source of labour, which should be trained for vocations. This could contribute to solve their issue of unemployment and reduce over fishing using both illegal and legal fishing gears.

Some alternative livelihoods training needs that were mentioned as:

- Fish processing (local and in factory)
- Pig husbandry
- Cage culture
- Garments factory
- Construction company (labour force)
- Export labour

### 2.1 Pond culture

#### *Training*

Most of the interviewed aquaculture farmers reported that they received various types of aquaculture and aquaculture related training from FEC, DARD, HUAF, CSSH and companies like CP group and Bayer. The FEC and CP group conducted aquaculture training without any needs assessment. The farmers mentioned that the training provided by FEC was not effective as it was theoretical instead of hands on practical and did not meet their expectations. Also the distributed training materials were not relevant and not adapted to their level of understanding. The training from fisheries feed company (CP Group; Bayer) was just for the advertisement of their products. The farmers mentioned that their training was not practical oriented and applicable at the field level. HUAF carried out a one month training programme. However the farmers did not have enough time to participate more than 1 week. As a result they did not find the training successful. The farmers mentioned that large scale training is not useful and not effective. They prefer small scale on-site hands-on training. Understandable training material should be distributed among the farmers.

#### *Area and activity characteristics*

☐ In general two types of pond culture can be distinguished, namely high-tide and low-tide culture. The main criteria of high tide ponds are Intensive monoculture of shrimp / high stocking density, higher inputs investment, pond bottom can be drained and dried, less prone to natural hazards, higher expectation for success, but greater loss in cases of failure, relatively low success rate (high risk), 2 crops/year. On the other hand the low tide ponds possess improved extensive polyculture of shrimp/low stocking density, prone to natural hazards, pond bottom can not be drained and dried, lower inputs investment, less profitable in case of success, but loss is relatively small in case of failure and relatively high success rate (low risk).

The culture period from January-August (lunar calendar) but this may differ somewhere from one area to another area. The main shrimp species that is selected by farmers is Tiger prawn (Tôm sú). They bought shrimp seed from Đà Nẵng (70-80%). They said that they have had successful experiments with Greasy-back shrimp (Tôm Rào). The main fish species are Rabbit fish (Cá Dĩa) and Dorab (cá kình). They alternately use industrial feed and live feed during different phases of the culture period. It is reported that the farmers rely on luck for a successful crop because they have no way whatsoever to control or check the quality of the shrimp seed.

### **Gender roles**

Although men and women share the work at ponds, men play a more dominant role. This is accepted by the women, who say that in terms of aquaculture techniques men are more knowledgeable. Women take care of the finances, the water level, the live feed (trash fish/shrimp, which is available at local market), harvesting and sale (shared activity). Men take care of the health care of fish/shrimp and the physical work like pond preparation and construction of dykes. Women rarely attend training courses. When asked if women prefer to have a training course specifically organized for them they said that it would not be a necessary. They said men would deal with the training.

### **Difficulties**

<b>Difficulties</b>
Lack of Input budget
Pollution
Uncontrolled quality seed
Lack of market information and access
Lack of knowledge on fish seed selection
Lack of knowledge on fingerling transportation and stocking techniques
Fish disease

- Lack of input budget. Farmers are unable to borrow more money from the bank since they are unable to repay the current loans. As a consequence they turn to private money lenders who charge them higher interest rates. In this area this source of private loan is not as easily accessible as in other areas. As a result farmers are forced to sell their products to these moneylenders who work together to force the price down ('A skillful hand is not as beneficial as a large budget').
- Pollution from factories, agriculture and domestic waste along the Perfume River. Besides aquaculture was developed in the area without proper planning. This leads to sequential years of diseases and losses. Because of a bowl at the end of the river before the inlet, the pollution stays in the area (more then in other areas).
- Quality of seeds is not controlled. Even shrimp that have been tested (PCR) still grow slow and are susceptible to disease. Farmers suspect the parent shrimp is utilized for multiple reproductions. The role of stations for quality test of shrimp is only to fulfil some bureaucratic procedures to receive money rather than to guarantee the quality.
- Lack of market information and market access. Prices are forced by private dealers.
- Lack of knowledge on fish seed selection. They don't have any practical knowledge on selectivity of fingerling so that some times they have disease problem with Butter fish: Ca Chim as the symptoms of this disease is infection of body surface and eye becomes blind and also the body surface is covered by grassy weeds. In lunar February this disease occurred soon after (5-10 days later) Ca Chim (Butter fish) has been stocked with other species.

- Lack of knowledge on fingerling transportation and stocking techniques. Most of the farmers don't know the fingerling transportation device, fingerling acclimatization and exact way of stocking.
- Fish disease comes externally from water, which the people said is polluted by factories' discharged matters and living pollutants from upstream of the Perfume River.

### ***Training needs***

#### **Directly related to target activity:**

##### **Key**

- Training on how to deal with a polluted environment outside the pond.
- Supply of trustworthy chemicals and medicine and how to apply it.
- Shrimp feeding techniques
- Water environment control in culture pond
- Post larvae selection techniques (various species)
- Independent seed quality control
- Disease prevention and mitigation

##### **Others**

- Fish pond culture techniques (fish seed selection, Stocking density, feed, transportation and disease control)
- Pond construction and preparation techniques
- Polyculture techniques
- Crab (cua) culture techniques
- Dorab (cá kình) culture techniques
- Fingerling nursery techniques
- Techniques for mono-culture of shrimp

#### **Indirectly related to target activity:**

##### **Key**

- Lack of input budget (Business planning & management)
- Market access and information
- Vocational training (alternative livelihoods)

##### **Others**

- Aquaculture planning and management
- Post -harvesting
- Gender and community development
- Conservation of natural resources
- Establishment of fishery association in village

### ***Differences in needs for different areas***

In areas observe to the river mouths and culture from the inlets or besides the house of farmers. Fresh water and brackish water pond culture techniques are different than another area. For example in Loc Binh commune there is fresh water fish pond which are near to farmer's house and on the other hand most of the culture activities of Dien Hai commune are near to river mouth.

Fresh water fish pond in Loc Binh commune of Hai Binh village: In Hai Binh village (Loc Binh commune) each household reported that they possess averages 1-2 fish ponds. Most of their ponds are located beside their house. Most of them didn't receive any fish culture training but they learnt themselves. They usually buy fingerling from Hue Nam giao hatchery which is 40 km far from this village. They usually do polyculture with 3 species and 2 options. The option 1 (Tilapia: Ca ro phi, Butter fish: Ca Chim & Grass carp: Tram Co and the option 2 ( Common carp: Ca Chep, Cat fish: Ca tre & Mud carp: Ca troi). The average size of the ponds is 150-200m<sup>2</sup>. They usually stock in February and harvest in December (Lunar time).

Culture activities in Dien Hai commune: The majority of the 1,300 households living in Dien Hai commune and most of them having fresh water ponds.

## **2.2 Cage culture**

### ***Training***

In Vinh Hien and Hai Duong Commune respondents reported that they have never received any training on fish cage culture.

### ***Area and activity characteristics***

In Vinh Hien Commune the dominant system is a low density polyculture of 2-3 species. Grouper, Red snapper, Sea bream which are raising in cage in the last 5-6 years. They usually stock all species from May to September and took out grouper and bream from the cage during the winter as the salinity of water declined. DOFI imported Ca Vuoc (Sea Bass/giant sea perch, *Lates Calcarifer*) from Thailand and they tried to artificial breeding here. In the past local people used to make fish sauce from young fishes that are caught in the surrounding sea and lagoon. Now these young fishes that are caught from the wild, kept for cage culture as people discovered this is more beneficial of Ca mom (Silver Bidy, a kind of small sized fish). In this circumstances cage culture activities are sustainable for the poor communities to earn money to survive their livelihood. This culture facility so acceptable and low risk for them apart from shrimp farming. They are really needy, poor and hardworking. A total of 143 households (Out of 1,440) of Hai Duong commune are doing cage farming and 74 households (Out of 235) of Ha Nam village are involved with cage culture of this commune.

### ***Gender roles***

Men are reported to be responsible for 60-80% of the workload in cage culture. Men make decisions on technical issues of culture activities. Women play a secondary role and carry out task as instructed by men. However women play a more dominant role in the purchasing feed and the sale of products.

## ***Difficulties***

Difficulties
Lack of knowledge on effectively handle on quantity and quality of fingerlings
Fish health management, disease prevention and mitigation
Lack of capital
Pollution from high-tide shrimp culture and domestic waste
Desalinization due to impact of freshwater in the flooding season
Lack of market access and information

- **Lack of technical knowledge on Fish cage farming:** As they didn't receive any sort of technical training on cage farming so that they don't know basic knowledge such as accurate stocking density, proper handle of the fingerlings in terms of quantity & quality, amount of feed and fertilizers at the different level as well as don't know fingerling size based on species and cage size. They are not aware of treatment of diseased fish but they merely usually separate the diseased fish to another as their local experience. They also don't know to protect pollution from high tide shrimp culture.
- **Insufficient capital:** Each household having constraint with lack of fund to enhance their cage farming. They usually borrowed money from VBARD with 1.3 - 1.4% interest rate but should be realized the interest rate on time. So, they prefer borrow money from neighbour or rich friends albeit the interest rate is 2.0% as there is flexibility to realize the loan. Unfortunately they need to sell the young fish from the cage to purchase the live fish feed locally and some extent for the repair the cages. One household needs 10-15 million VND in the beginning of 2 years for buying live fish feed, cage prepare equipments and if they get this amount for first 2 years with low interest rate they could be succeed in this cage culture venture and refund the debt.
- **Lack of market access and information:** The individual household can sell all fish (70-80 kg) at the same time but unfortunately they usually sell as partial (5 or 6 kg as an example) at different time prior heir needs and this is not much useful for them and they can't save money. Besides they also can't sell all fish at the same time because of the fluctuation of fish price. They prefer to sell fish locally in getting better and higher price. They only exported grouper through middle men while the price is 70-80,000 VND/kg and remaining other fishes are being supplied to local market and restaurants.

## ***Training needs***

### **Directly related to target activity:**

#### **Key**

- Brackish-salt water fish culture (different species)
- Fish cage culture techniques including disease control and prevention
- Fingerling nursery techniques
- Fish polyculture
- Identification of optimal feed amount

#### **Others**

- Fish cage design and making
- Fish cage system planning
- Identification of fish cage setting

- Brackish water fish raft culture

**Indirectly related to target activity:**

**Key**

- Market information and market access
- Vocational training for employment
- Business planning and management

***Differences in needs for different areas***

In Dien Hai commune it has been reported from TNI that the most important types of aquaculture are fish-cage culture. On the other hand In Hai Duong (Village: Ha Nam) and Vinh Hien (Village: Hien An 1) there have been carried out salt water and brackish water fish cage farming by the farmers.

## 2.3 Net enclosure

### *Training*

In Phu Xuan Commune respondents reported that they have never received training on net enclosure techniques.

### *Area and activity characteristics*

This area used to be rich in lagoon resources. The main activity was shallow stake traps and the catch was high. However as the number of fishing activities and fishermen increased the catch declined. As a result of the catch decline people started to construct net enclosures to ensure their catch, by combining aquaculture and capture fisheries (mainly trammel nets) inside the enclosed area. Culture species include Tiger prawn, cá Dìa, cá Kinh and crab. Species for stocking are collected mainly from the wild and are to be reported in the lagoon in October. At this time, young fishes are available in great number and of proper size to be stocked. After the flooding season the environment is stable and resources are abundant. Fishermen do many continuous crops and the last crop ends in July or August, just before floods come (fresh water).

Locations for net enclosures are usually divided into two different types, namely inner and outer locations. The type of location does not affect the overall degree of success; however it does incur a different kind of risk. Inner locations are vulnerable to pollution from agriculture and aquaculture, less nutrients and a higher water temperature, while outer locations are vulnerable to natural disasters.

### *Gender roles*

Husband and wife contribute an equal amount of time and labour to their net enclosure. The daily tasks of women include the daily care for the family, children's education and business planning. Furthermore they take care of fixing nets, collecting the catch (together with husband) and selling the catch at the market. Men take up more physical work like building or fixing enclosure.

### *Difficulties*

Difficulties
Lack of capital
Quality and quantity of seed
Lack of market access and market information
Pollution

- Lack of capital for the initial crop and to repair the nets. The reason reported for this lack of access to credit is either the lack of property to mortgage (brick house) or the fact that a household is already in debt with the bank.
- Low quality and high price because of high demand and reduced availability because of Lưới Mùng near Thuận An
- Forced low price of main crop output and lack of market information and market access
- Pollution due to agriculture and aquaculture (especially inner net enclosures)

### ***Training needs***

#### **Directly related to target activity:**

- Selection of culture species.
- Stocking density.
- Polyculture techniques (which combination of species and how many of each)
- Training on the causes and prevention of pollution. This includes proper application of bio-chemical products and how to construct a storage pond (for water intake/discharge) to lessen pond and environmental pollution.
- Nursery techniques.

#### **Indirectly related to target activity:**

- Fish processing.
- Other vocational training (alternative livelihoods).
- Financial planning (pays back the debt or buys things for the house?)
- Training for shrimp farmers and rice farmers for better management practices to reduce pollution of the natural environment.

## **2.4 Mollusc Culture**

### ***Training***

In Loc Binh Commune respondents reported that they have never received training on aquaculture by DOFI or project. Only invitations to training were extended to individual representatives and a few people were attended. Only one man attended one day training course on fish cage techniques conducted by CPC. This training was covered feeding techniques and health care. 2 people from this group attended the 2 days class room training organized by PPC on fish culture and livestock. This training provided them some training materials. They paid visit Vinh Hien commune at Hien Hoa village and saw their demonstration fish farming. Since that they've been started and replicate their applied techniques in their place.

### **Area and activity characteristics**

A total of 30 households (Out of 57) of Hai Binh village are doing mollusc culture in cage and snails (*Babylonia sp*) are cultured in it. Mollusc culture in cage is the major activity for them. They are doing this activity since 2004. From March to July (5 months) they usually do his job. They invest more money in mollusc culture than other activities. Mollusc culture in cage at lagoon: low tide, salinity: 15-30 ‰ (winter) and 30-35 ‰ (summer)

### **Gender roles**

The development of aquaculture activities will create more employment opportunities for both genders. Mollusc culture households: equal roles

Men: feed/fishes, treat water, discharge water, decide cropping time and Women: take care of children, manage daily expenses, and prepare fish feed

### **Difficulties**

Difficulties
Lack of market access and information
Lack of technical knowledge (Mollusc and fresh water fish)
Lack of fund/budget

- **Lack of market access and information:** There is no local market access for mollusc product so that the traders usually come and buy from them as lower price. The local people don't know how to solve this problem. Interestingly if molluscs products might have disease they can't sell as quickly so that most of the products would be spoiled and getting very lower rate from the local market.
- **Lack of knowledge on mollusc disease:** Sometimes snails (molluscs) are affected by disease and it whole body seems to be bad smell so that as quickly should be marketing and if delay most of them have been thrown away.
- **Lack of fund/budget:** Some of the farmers can't run the mollusc culture as they have not enough fund or capital. They tried to borrow money from bank but the interest rate very high (1.15%/year) so that they borrow money from their rich friend and neighbours.

### **Training needs**

#### **Directly related to target activity:**

- Mollusc (oyster, clam and mussel) culture techniques
- Mollusc cage culture techniques (snail *Babylonia sp* disease control and prevention)
- Business planning and management

#### **Indirectly related to target activity:**

- Vocational training (including for fishermen using destructive fishing tools)
- Business planning and management

## **2.5 Stake traps**

### ***Training***

Respondents reported that they have never received training on lagoon capture fisheries. Fishing with shallow stake traps is a traditional occupation, which is handed down from father to son and people learn from each other's experience.

### ***Area and activity characteristics***

Traditionally stake traps were usually made of bamboo but now changed into net and partial bamboo. As bamboo materials are expensive and easily rotten while net is long lasting and cheaper. Stake traps were completely made out of bamboo. After storm number 8 (1995) destroyed all the stake traps most of the bamboo was replaced by nylon and nowadays bamboo is only used for stakes. Stake traps are a year round activity, but there are high seasons and low seasons vary from one area to another. Profitability of stake traps also varies from one area to another.

The village (Ha Do of Quang Phuoc commune) is surrounded by Tam giang lagoon and a total of 56 households are living in this village. 40 households of them are involved in stake trap/fish corral activities (besides shrimp ponds). Each household possess 1-2 fish corral. This village is occupied by shrimp pond so that the stake traps activity is being gradually decreased and at the same time the breeding area of fish also has been destroyed. Also the electric fishing and cast net fishery are hampering this activity. They catch Ca the, Ca bong (goby fish) and Tom rao (earth shrimp) by this gear. The peak period of catch is the rainy season that is August to October (lunar year) while the current of lagoon area faster. The price of fish corral products would be lower in peak period (rainy season) but other time price is normal and stable.

In general stake traps in Vinh Hien Commune (Village: Hien Van II), which is close to Tu Hien inlet, are more successful than traps in communes further away from the inlet. Species composition is also different as stake traps closer to the inlet catch marine's species rather than lagoon species. Furthermore there are also differences within communes. Stake traps placed in deeper areas where the current is stronger are more successful during the summer when the water level is low. Stake traps located in more shallow areas, where the current is weaker, are more successful during the winter when the stake traps in the deeper areas are submerged and catch nothing.

### ***Gender roles***

Since it takes two people to keep a boat balanced husband and wife contribute an equal amount of time and labour while fishing out in the lagoon. Furthermore both husband and wife guard the stake traps during the night. In general men tend to focus on carrying out the more physically demanding tasks, like fixing the stakes and diving under the water, while women carry out tasks like repairing and cleaning the nets. Besides housework, which is chiefly a woman's task, women take care of the financial issues of the family such as dealing with debt and money lenders, selling catch (they have market information), planning family expenditures, etc.

## **Difficulties**

<b>Difficulties</b>
Catch decline
Lack of capital
High cost of inputs and other commodities
Lack of alternative livelihood opportunities
Lack of market access and market information
Lack of life insurance of the fisherfolk
Lack of identification of fishing territory

- **Catch decline:** There are some reasons for declining catch such as pollution from aquaculture and domestic waste, reduced area available for nursery grounds for young fish as a result of the construction of aquaculture ponds, conflict with destructive activities (electric fishing, **small kind of bottom net (lủ)** and trammel nets). This Kind of bottom net trap called as "Lủ" is usually operated during the day time under the fish corral while fish corral people at home and also they fixed this trap at night time while the corral people sleep at home. This trap is 5 meter in length and 0.5 meter at mouth. It is reported that Sampan people usually doing this kind of "lủ" exploitation.
- **Lack of capital:** Insufficient access to credit as a result of complicated procedures.
- **High cost of inputs and other commodities:** Increase price for stakes, nets, bamboo and the cost of living
- **Lack of alternative livelihood opportunities:** Increasing population and a lack of alternative employment
- **Lack of market access and market information:** Lack of market access and market information (stable price for outputs)
- **Lack of life insurance of the fisherfolk:** Life risk to work for the fisherfolk at lagoon area during the stormy/natural depression time.
- **Lack of identification of fishing territory:** There is no specific fishing zone or territory so that a lot of outsider people are involved with stealing fish in others territory. So, a good plan to provide the community water user rights in their area so that no one can enter their territory prior their permission. In this circumstance CPC should identify the zoning of fishing ground/area which enables to maintain the fishing area and water user rights.

## **Training needs**

### **Directly related to target activity:**

#### **Key**

- Training on techniques to prolong the life-span of stake traps (e.g. deterioration of nets and rotting of bamboo stakes).

**Indirectly related to target activity:**

**Key**

- Vocational training
- Training on improving market information and access (Vinh Hien).
- Training on access to bank credit.
- Training of establishing fisheries association with incentives for the leaders (to improve fisheries management and reduce conflicts with mobile gear fishermen).
- Training for shrimp farmers for better management practices to reduce pollution of the natural environment.
- Improve fisheries management related to strict ban of electric fishing.
- Find a solution to domestic waste disposal.
- Business planning and management

***Differences in needs for different areas***

In areas of lower productivity the issue of market information and access appears to be less important as the product is sold mainly for local consumption. In this case the Vinh Hien commune (close to Tu Hien inlet) households usually sell their products as well as to export other province while the households of Quang Phuoc and Vinh Hung communes sell the products only for local consumption.

## 2.6 Bottom nets

### *Training*

Respondents reported that they have never received training on bottom nets. Fishing with bottom nets is a traditional occupation, which is handed down from father to son.

### *Area and activity characteristics*

In Quang Ngan commune bottom nets are used every day from February to August (lunar calendar). The most productive period is July-August. When the tidal amplitude and thus the strength of the tidal flow are at its maximum the catch is highest. In winter's time (October-February), catch is high on rainy or flooding days. People in Quang Ngan commune refer to bottom nets as the most successful fishing activity in this area. The most favourable location for bottom nets is the place where the water is deep and the current is strong. These are areas that are unsuitable for stake traps. In Quang Ngan Commune each household that fishes with bottom nets operates an average of 6 – 7 nets. Bottom nets are used once a day when current is strong and the tide starts to move out to sea. The nets are lifted when the tide starts to turn. The main species that is caught using bottom nets is earth shrimp (Tôm Đất) fish are caught less.

In Vinh Hung commune the bottom nets are operated 2 times a year like 1st time: January to February and 2<sup>nd</sup> time: June to August. During the high tide time (Jan – Feb) no operation of bottom nets while the low tide time (peak period). People from Vinh Hung commune opined that since 1975 to 1985 bottom net activities were very popular and successful. A total of 50% of the households of this commune were doing bottom net activities. 50% households did bottom net activities and 50% are engaged with cast net fishery and fish corral during the 1975-1985. After 1985 bottom net activities are converted into shrimp pond and using fish corral so that the current of wave turns slow, bottom net can not suitable for this condition. Construction of shrimp pond occupies a certain place of the bottom net which leads to decline the quantity of fish. At the same time discharge waste matters are released from the shrimp pond into the lagoon which polluted the lagoon water. In such way the bottom net activities gradually disinteresting and unsuccessful among the farmers. Now only 10% households are doing bottom net activities. They changed bottom net activities into fish corral because bottom net need fast flowing current water while low flowing water required for corral fishing. The catch per unit effort (CPUE) is higher in fish corral than bottom net. Each household possess 3-5 bottom nets. It is noticed from men group that recently bottom nets are going to be decreased as it makes a little profit for the family but women group want to keep it and continue as it is originated from heretically. The caught fish species from the bottom nets are mainly shrimp, and others like Ca mom (silver biddy), Ca The, Ca liet and Ca sam. (Ca The: a local name for Goby. Ca Liet: Vietnamese vernacular name for *Leiognathus splendens*, or splendid pony fish). They reported that they only continue bottom nets when the fish are available in lagoon otherwise they would postponed for a while their activity until the fish are available.

### **Gender roles**

On the water as well as on the land the bottom net requires the hands of both men and women although men take care of the more physical tasks (in such more physical work as building or fixing gears, cleaning net). Women are more active in house/family work and deal with sales and financial issues.

### **Difficulties**

Difficulties
Intensive exploitation
Catch decline
Conflict with trammel nets and electric fishing
Reduced quality of nets
Poles of stake rot easily

- **Intensive exploitation:** Reduction of fish and shrimp leads to low income
- **Catch decline:** People reported that, even though they use more nets, they catch 3 times less than 7-10 years ago.
- **Conflict with trammel nets and electric fishing:** Ban and stop electric fishing by local and outsiders.
- **Reduced quality of nets:** More expensive high quality imported nets are no longer available. These nets are more suitable for the deeper locations.
- **Poles of stake rot easily:** Poles are expensive but rot easily as wooden made.

### **Training needs**

#### **Directly related to target activity:**

##### **Key**

- Training on techniques to prolong the life-span of bottom nets (e.g. deterioration of nets and rotting of poles).

#### **Indirectly related to target activity:**

##### **Key**

- Improve fisheries management related to strict ban of electric fishing.
- Vocational training (alternative livelihoods). Including fishermen using destructive fishing tools
- Training for shrimp farmers for better management practices to reduce pollution of the natural environment.

### **Differences in needs for different areas**

In Quang Ngan commune is considered to be a successful activity of bottom net fishery while it has been declining in Vinh Hung commune as a result of shrimp ponds are expanded.

## 2.7 Gill nets / Trammel nets

### *Training*

Respondents reported that they have never received training on lagoon capture fisheries.

### *Area and activity characteristics*

Fishing with Gill nets and Trammel nets is carried out the year round, the most intensive being March to August (lunar calendar), as these are months of rich resource. In the rainy season, resources are reduced except for days of strong current or flooding. Gill nets are more selective than trammel nets and therefore trammel nets are often mentioned by other fisherfolk as a destructive kind of fishing gear.

In Quang Cong commune (Village: 14) a total of 25 households are involved with this profession (trammel/gill net) and only poor people are doing this kind of job and if any kind of better opportunity turns around them they will leave this profession similar to Phu Xuan and Vinh Hung commune. Each household has an average 1-5 fishing nets. Most of them are cheaper gill nets. Trammel nets are made by two types of materials such as polysynthetic net (do) and plastic net (gac) which are used to catch fish and crab. Gill nets are cheaper than trammel net. Trammel nets are more profitable and useful. During the non windy time catch per unit effort (CPUE) has been declined but windy time can't work in the lagoon area as the wave of the lagoon turns strong. If they're financially better off they usually able to buy more trammel nets. Some of women participants quoted about cage farming as alternative livelihoods. They preferred alternative livelihoods like cage culture but as reason lack of budget/fund and also if they would have enough money to buy trammel nets they would actually prefer to use the money to change their livelihood. Most of them can't get loan from the bank as they don't have property to show the bank while some of them have property but are afraid to take the risk.

### *Gender roles*

In terms of gender division of labour men and women participation are equal. The daily tasks of women include the daily care for the family, children's education and business planning. Furthermore they take care of fixing nets, collecting the catch (together with husband) and selling the catch at the market. Men take up more physical work like building or fixing enclosure.

### *Difficulties*

Difficulties
Lack of capital to buy different kinds of nets
Reduced area for capture as a result of aquaculture expansion
Dependence on the weather
Catch decline
Destructive fishing (Electric fishing)
Over fishing
Insufficient fishing gears

## *Training needs*

### **Directly related to target activity:**

#### **Key**

- Training on the causes and prevention of pollution (for water intake/discharge) of pond.

### **Indirectly related to target activity:**

#### **Key**

- Training on credit information and access.
- Vocational training to reduce unemployment.
- Training of how to process the catch.
- Business planning and management

### 3 CONCLUSION

The TNA survey has identified appropriate training needs and priorities at the commune and village level for the lagoon communities (Aquaculture and capture fisheries) under the different target activities (**The comprehensive list of training topics are summarized under seven target activities in Annex 2** and details raw list of training topics at commune/village level which is appeared in *Annex 6*). Generally we emphasized the targeted specific activities through TNI & TNA surveys and not the overall training needs of the people living in lagoon communes. For this it can be referred to the PRA SLA report of the project.

The first TNI workshop at Dien Hai commune developed 5 competencies (Shrimp culture in ponds, fish culture in cages, fish culture in ponds, lagoon management and fish & shrimp marketing) based on their occupational profiles which has been followed by DACUM (Developing a Curriculum methodology). The TNI identified a sort of training needs (based on 5 competencies) of fisherfolk, aquaculture farmers, extensionists, middle person and fishery association (The identified list of training topics are found in *Annex 7*). So, the TNI outputs and this TNA findings have to be combined together and will be used in the preparation of the IMOLA project training plan and design at the commune and village level aquaculture farmer and fisherfolk in the forthcoming time. Through this TNA output from 11 communes it has been recognized that it was fulfilled our goal in getting such valued and necessary information for the different type of target group and activities. So that the IMOLA will envisage and proceed to make plan and design to develop the commune/village level training for the Aquaculture farmers and fisherfolk at target 12 communes including Dien Hai of the project.

## Annex 1: On-Site TNA Framework

1	Introduction
2	Training inventory
3	Area characteristics
4	Activity characteristics
5	Gender roles related to specific activity
6	Problem analysis related to specific activity
7	Problems related to area characteristics
8	Training needs and priority
9	Training priorities related to area characteristics

<b>1. INTRODUCTION:</b>		
1	Personal	
2	IMOLA Project	
3	On-Site TNA objective / purpose	
<b>Basic information:</b>		
Date:	...../5/2006	
Commune:		
Village:		
Activity:		
Team member:		
Team member:		
Team member:		
<b>Name of participant:</b>	<b>Age:</b>	<b>Gender:</b>

<b>2. TRAINING INVENTORY:</b>		
Extension training received	What organization	
	Topic of the training	
	What type of training	Class, workshop, practical hands on, etc.
	What kind of material	Extension materials and tools
	When	
Extension effectiveness	Why / why not	
Adoption of techniques	Why / why not	
Preferred type of training	What type of training	Class, workshop, practical hands on, etc.
<b>3. AREA CHARACTERISTICS:</b>	<i>Pond</i>	<i>Other</i>
	High tide /low tide	
	Sandy/muddy	
	Fresh / brackish / salt	Fresh / brackish / salt
	Seasonality	Seasonality
	(Un)successful	(Un)successful
		Strong / weak current

<b>4. ACTIVITY CHARACTERISTICS:</b>	
<i>Aquaculture</i>	<i>Capture fisheries</i>
Type of culture	Current capture techniques
Current culture techniques	Recommended capture techniques
Recommended culture techniques	Differences between current and recommended practices
Differences between current and recommended practices	
Crops	
Species	
Experimentation: species, crop rotation, poly-culture	
<b>5. GENDER ROLES RELATED TO SPECIFIC ACTIVITY:</b>	
<b>6. PROBLEM ANALYSIS RELATED TO SPECIFIC ACTIVITY:</b>	
<b>7. PROBLEMS RELATED TO AREA CHARACTERISTICS:</b>	

<b>8. TRAINING NEEDS &amp; PRIORITIES:</b>	
<i>Aquaculture</i>	<i>Capture Fisheries</i>
Pond/Cage & facilities preparation	Technical fish training
Grow-out techniques	Boat, gear and net repairing
Disease prevention & mitigation	Business planning
Water quality monitoring & improvement	Basic capture fisheries economics
Backyard hatchery operations	Record & bookkeeping
Seed selection	Post harvest
Seed nursing	Fish and Shrimp marketing
Feed/food management	Feed/food management
Business planning	Management/planning capture fisheries
Basic aquaculture economics	Alternative livelihoods
Record & bookkeeping	No training need
Post harvest	
Fish and Shrimp marketing	
Management/planning aquaculture	
Alternative livelihoods	
No training need	
<b>9. TRAINING PRIORITIES RELATED TO AREA CHARACTERISTICS:</b>	

## Annex 2: Summary of Training needs and Priorities based on Target Activity

Target Activity	Training Needs and Priorities
<b>A. AQUACULTURE</b>	
Pond culture	<ul style="list-style-type: none"> <li>• Water environment control in culture pond</li> <li>• Post larvae selection techniques (various species)</li> <li>• Independent seed quality control</li> <li>• Disease prevention and mitigation</li> <li>• Training on how to deal with a polluted environment outside the pond.</li> <li>• Supply of trustworthy chemicals and medicine and how to apply it.</li> <li>• Shrimp feeding techniques</li> <li>• Fish pond culture techniques (fish seed selection, Stocking density, feed, transportation and disease control)</li> <li>• Pond construction and preparation techniques</li> <li>• Polyculture techniques</li> <li>• Crab (cua) culture techniques</li> <li>• Dorab (cá kình) culture techniques</li> <li>• Fingerling nursery techniques</li> <li>• Techniques for mono-culture of shrimp</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Lack of input budget (Business planning &amp; management)</li> <li>• Market access and information</li> <li>• Aquaculture planning and management</li> <li>• Post -harvesting</li> <li>• Gender and community development</li> <li>• Conservation of natural resources</li> <li>• Establishment of fishery association in village</li> <li>• Vocational training (alternative livelihoods)</li> </ul>
Target Activity	Training Needs and Priorities

Cage culture	<ul style="list-style-type: none"> <li>• Brackish-salt water fish culture (different species)</li> <li>• Fish cage culture techniques including disease control and prevention</li> <li>• Fingerling nursery techniques</li> <li>• Fish polyculture</li> <li>• Fish cage design and making</li> <li>• Identification of optimal feed amount</li> <li>• Fish cage system planning</li> <li>• Identification of fish cage setting</li> <li>• Brackish water fish raft culture</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Market information and market access</li> <li>• Vocational training for employment</li> <li>• Business planning and management</li> </ul>
<b>Target Activity</b>	<b>Training Needs and Priorities</b>
Net enclosure	<ul style="list-style-type: none"> <li>• Selection of culture species.</li> <li>• Stocking density.</li> <li>• Polyculture techniques (which combination of species and how many of each)</li> <li>• Training on the causes and prevention of pollution. This includes proper application of bio-chemical products and how to construct a storage pond (for water intake/discharge) to lessen pond and environmental pollution.</li> <li>• Nursery techniques.</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Fish processing.</li> <li>• Other vocational training (alternative livelihoods).</li> <li>• Financial planning (pays back the debt or buys things for the house?)</li> <li>• Training for shrimp farmers and rive farmers for better management practices to reduce pollution of the natural environment.</li> </ul>
<b>Target Activity</b>	<b>Training Needs and Priorities</b>
Mollusc culture	<ul style="list-style-type: none"> <li>• Mollusc (oyster, clam and mussel) culture techniques</li> <li>• Mollusc cage culture techniques (snail <i>Babylonia sp</i> disease control and prevention)</li> <li>• Business planning and management</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Vocational training for fishermen using destructive fishing tools</li> <li>• Business planning and management</li> </ul>

<b>B. CAPTURE FISHERIES</b>	
<b>Target Activity</b>	<b>Training Needs and Priorities</b>
Stake traps	<ul style="list-style-type: none"> <li>• Training on techniques to prolong the life-span of stake traps (e.g. deterioration of nets and rotting of bamboo stakes).</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Vocational training</li> <li>• Training on improving market information and access.</li> <li>• Training on access to bank credit.</li> <li>• Training of establishing fisheries association with incentives for the leaders (to improve fisheries management and reduce conflicts with mobile gear fishermen).</li> <li>• Training for shrimp farmers for better management practices to reduce pollution of the natural environment.</li> <li>• Improve fisheries management related to strict ban of electric fishing.</li> <li>• Find a solution to domestic waste disposal.</li> <li>• Business planning and management</li> </ul>
<b>Target Activity</b>	<b>Training Needs and Priorities</b>
Bottom nets	<ul style="list-style-type: none"> <li>• Training on techniques to prolong the life-span of bottom nets (e.g. deterioration of nets and rotting of poles).</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Improve fisheries management related to strict ban of electric fishing.</li> <li>• Vocational training (alternative livelihoods). Including fishermen using destructive fishing tools</li> <li>• Training for shrimp farmers for better management practices to reduce pollution of the natural environment.</li> </ul>
<b>Target Activity</b>	<b>Training Needs and Priorities</b>
Gill nets / trammel nets	<ul style="list-style-type: none"> <li>• Training on the causes and prevention of pollution (for water intake/discharge) of pond.</li> </ul>
Others	<ul style="list-style-type: none"> <li>• Training on credit information and access.</li> <li>• Vocational training to reduce unemployment.</li> <li>• Training of how to process the catch.</li> <li>• Business planning and management</li> </ul>

### Annex 3: Team composition

Team No	Team members
1	Arie Pieter van Duijn (FAO), Nguyen Minh Đức (FEC-DOFI), Le Xuan Hoang (FAO translator)
2	Vo Thi Tuyet Hong (FEC-DOFI), Nguyen Van Huy (HUAF)
3	Md. Ghulam Kibria (FAO Consultant) , Ton That Chắt (HUAF) Vinh Xuan Phuong (FAO translator)
4	Nguyen Quang Linh (HUAF) and Nguyen Hong Viet (FEC-DOFI)
5	Md. Ghulam Kibria (FAO Consultant) , Le Xuan Hoang (FAO translator)

### Annex 4: On-Site TNA program

Commune:	Village:	Team	Target activity	Time/date	Location
Vinh Hien	Hien Van II	1	Stake traps	Wed, 03/05/2006, 8:00- 11:30AM	Mr. Lê Tịnh,
	Hien An 1	2	Cage culture		Village house
Loc Binh	Tan Binh	3	Mollusc culture	8:00- 11:30AM	Phan Cố's house
	Mai Gia Phuong	4	Pond culture		Hùynh Đẩu
Vinh Hung	Trung Hung	1	Pond culture, stake traps	Wed, 03/05/2006, 1:30-4:30PM	Huỳnh Diên
	Phung Chanh	2	Pond culture		Trần Đình Văn
Vinh Xuan	Mai Vinh	3	Pond culture	1:30-4:30PM	Nguyễn Khởi
	Xuan Thien Ha	4	Pond culture		Nguyễn Ngọc Tự
Phu Xuan	Thuy Dien	1	Net enclosure, Gill nets, Trammel nets	Thu, 04/05/2006, 8:00- 11:30AM	Nguyễn Đoàn
	Le Binh	2	Pond culture		Trần Đài
Vinh Phu	Doi 16	3	Bottom nets	8:00- 11:30AM	Nguyễn Minh
	Ha Bac	4	Pond culture		Community house
Huong Phong	Thuan Hoa	1	Pond culture	Thu, 04/05/2006, 1:30-4:30PM	Nguyễn Tự
	Van Quat Dong	2	Pond culture		Phan Nghĩa
Hai Duong	Thai Duong Ha Bac	3	Cage culture	1:30-4:30PM	Võ Đố
	Thai Duong Ha Nam	4	Pond culture		Phan Mẫn
Quang Ngan	Thuy An	1	Bottom nets, Pond culture, Stake traps	Fri, 05/05/2006, 8:30- 11:30AM	Nguyễn Dương
	Vinh Tan	2	Pond culture		Ngô Thành
Quang Phuoc	Ha Do	3	Stake traps/Fish corral	8:30- 11:30AM	Võ Dương Hoá
	Phuoc Lap	4	Pond culture		Nguyễn Văn Tý
Hai Duong	Thai Duong Ha Nam	5	Salt water fish cage culture	Wed, 05/07/2006,	Phan Nang's house

Quang Cong	Village 14	5	Gill net/trammel net	8:00-11:30AM 1:30 - 4:30PM	Phan Hoa's house
Loc Binh	Hai Binh	5	Mollusc culture	Thus, 06/07/2006, 8:00-11:30AM 1:30-4:30PM	Tran Dinh Phuc's house
Vinh Hung	Trung Hung	5	Bottom net		Huynh Thi Phuoc's house
Quang Phuoc	Ha Do	5	Stake traps/Fish corral	Fri, 07/07/2006, 8:30-11:30AM	Village Meeting room

## Annex 5: TNA participants

No	Full name	Commune	Village	Age	Gender	Fisheries activity
1.1	Huỳnh Nhật	Vinh Hien	Hiền Vân II	49	M	Stake traps
1.2	Nguyễn Bảo			34	M	Stake traps
1.3	Nguyễn Phối			58	M	Stake traps
1.4	Trần Thị Kiểm			59	F	Stake traps
1.5	Trần Thị Mận			50	F	Stake traps
1.6	Nguyễn Thị Tuyết			35	F	Stake traps
2.1	Phan Văn Suý	Vinh Hien	Hien An 1	62	M	Fish culture and Capture fisheries
2.2	Hồ Kiểm			42	M	Fish culture
2.3	Phan Thị Khuê			47	F	Fish culture
2.4	Nguyễn Thị Bê			46	F	Fish culture
2.5	Doãn Hữu Phòng			54	M	Fish culture
2.6	Nguyễn Thị Mão			42	F	Fish culture
2.7	Nguyễn Thị Bê			37	F	Fish culture
2.8	Phan Thị Vân			29	F	Fish culture
2.9	Nguyễn Văn Sản			34	M	Fish culture
3.1	Ha Thuc Hai	Loc Binh	Tan Binh		M	
3.2	Huynh Bon				M	
3.3	Nguyen Con				M	
3.4	Tran Thi Quyt				F	
3.5	Huynh Thi Mot				F	
3.6	Nguyen Thi Hoa				F	
3.7	Phan O				M	
3.8	Ha Thuc Hung				M	
3.9	Huynh Van Khien				M	
3.10	Bui Dung				M	
4.1	Vo Huu Do	Loc Binh	Mai Gia Phuong	48	M	
4.2	Pham Loi			46	M	
4.3	Huynh Van Dau			49	M	
4.4	Nguyen Thi Gai			37	F	
4.5	Le Thi Tiem			38	F	
4.6	Phan Thi Cuc			38	F	
4.7	Nguyen Chu			28	M	
1.1	Nguyễn Anh	Vinh Hung	Trung Hưng	45	M	Stake traps, Pond culture
1.2	Huỳnh Đình			47	M	Pond culture
1.3	Dương Trường			50	M	Stake traps, Pond culture

No	Full name	Commune	Village	Age	Gender	Fisheries activity
1.4	Nguyễn Thị Mát			41	F	Stake traps, Pond culture
1.5	Phạm Thị Thoà			55	F	Capture fisheries, Pond culture
1.6	Nguyễn Thị Em			56	F	Stake traps, Pond culture
2.1	Trần Đình Văn	Vinh Hung	Phung Chanh	52	M	
2.2	Nguyễn Hào			51	M	
2.3	Phan Thị Mai			48	F	
2.4	Tần Đình Nam			34	M	
2.5	Nguyễn Thị Hoa			36	F	
2.6	Nguyễn Thị Hương Sen			47	F	
2.7	Nguyễn Thị Thành			28	F	
3.1	Phan Van Nhon	Vinh Xuan	Mai Vinh	67	M	
3.2	Pham Hiep			53	M	
3.3	To Dong Duc			37	M	
3.4	To Da			66	M	
3.5	Phan Thu			67	M	
3.6	Pham Lu			67	M	
3.7	To Huu Thuan			54	M	
3.8	Phan Toan			45	M	
3.9	Pham Dac Giau			60	F	
3.10	Le Ba Long			46	F	
3.11	To Ngoc Thanh			58	F	
4.1	Vo Van Quoc	Vinh Xuan	Xuan Thien Ha	52	M	
4.2	Nguyen Ngoc Tu			58	M	
4.3	Nguyen Mung			55	M	
4.4	Le Thi Thanh			47	F	
4.5	Le Thi Dung			47	F	
4.6	Nguyen Thi Hien			52	F	
1.1	Phan Văn Liên	Phu Xuan	Thủy Diện	83	M	Net enclosure
1.2	Hà Đức Lợi			53	M	Net enclosure
1.3	Nguyễn Đoàn			53	M	Net enclosure
1.4	Nguyễn Ly			45	M	Net enclosure
1.5	Phan Thị Nguyên			30	F	Net enclosure, Gill net, Trammel net
1.6	Hoàng Thị Tuyết			42	F	Net enclosure
1.7	Trần Thị Mót			57	F	Gill nets
2.1	Trần Văn Đài	Phu Xuan	Le Binh	57	M	
2.2	Nguyễn Thị Cam			46	F	
2.3	Trần Văn Dũng			47	M	
2.4	Trần Thị Rõ			45	F	
2.5	Trần Đại			60	M	

No	Full name	Commune	Village	Age	Gender	Fisheries activity
2.6	Trần Thị Huyền			49	F	
2.7	Trần Xê			37	M	
2.8	Trần Phước			42	M	
3.1	Tran Dinh Hoai Hien	Vinh Phu	Group 16		M	
3.2	Nguyen Minh			54	M	
3.3	Do Van Buong			46	M	
3.4	Do Van Thuong			52	M	
3.5	Tran Thi Mot			55	F	
3.6	Truong Thi Dieu			50	F	
3.7	Do Thi Thoi			40	F	
4.1	Dang Ngoc Tien	Vinh Phu	Ha Bac	54	M	
4.2	Pham Dong Son			39	M	
4.3	Pham Khanh			50	M	
4.4	Nguyen MINH			40	M	
4.5	Nguyen Vung			31	M	
4.6	Dang Van Khuong			60	M	
4.7	Truong Thi Nu			32	F	
4.8	Pham Dung			40	F	
4.9	Pham Thi Hoan			50	F	
1.1	Nguyễn Tự	Hương Phong	Thuận Hoà	64	M	Pond culture
1.2	Phan Văn Diếp			44	M	Pond culture
1.3	Phan Điệp			74	M	Pond culture
1.4	Đặng Thị Thái			61	F	Pond culture
1.5	Nguyễn Thị Dĩa			51	F	Pond culture
1.6	Đặng Thị Lý			62	F	Pond culture
2.1	Lê Tự	Hương Phong	Van Quat Dong	38	M	
2.2	La Kế			51	M	
2.3	Trần Thị Thanh			31	F	
2.4	Võ Thị Tho			56	F	
2.5	Phan Nghĩa			59	M	
2.6	Lê Văn Lân			61	M	
2.7	Trần Thị Tốt			46	F	
2.8	La Tiềm			43	M	
3.1	Tran Cong Hong	Hai Duong	Thai Duong Ha Bac	49	M	
3.2	Phan Van Huan			27	M	
3.3	Tran Do			51	M	
3.4	Vo Do			54	M	
3.5	Nguyen Thi Hai			57	F	
3.6	Nguyen Xuan Hieu			37	M	

No	Full name	Commune	Village	Age	Gender	Fisheries activity
3.7	Pham The Binh			26	M	
3.8	Tran Da Min			22	M	
4.1	Phan Hue	Hai Duong	Thai Duong Ha Nam	42	M	
4.2	Do Khac Loc			49	M	
4.3	Phan Nang			47	M	
4.4	Phan Lan			54	M	
4.5	Nguyen Huu Nam			40	M	
4.6	Nguyen Cang			50	M	
4.7	Phan Thi Cam			56	F	
4.8	Vo Thi Thuy			34	F	
4.9	Phan Van Duc			37.	F	
1.1	Nguyễn Xảo	Quảng Ngạn	Vĩnh Tân	58	M	Pond culture
1.2	Nguyễn Vân			46	M	Bottom nets, stake traps, pond culture
1.3	Nguyễn Tư			54	M	Pond culture
1.4	Nguyễn Ánh			41	M	Pond culture
1.5	Nguyễn Dũng			36	M	Bottom nets, stake traps, pond culture
1.6	Nguyễn Tín			41	M	Bottom nets, stake traps, pond culture
1.7	Nguyễn Thành			44	M	Bottom nets, stake traps, pond culture
1.8	Nguyễn Vườn			46	M	Bottom nets
1.9	Hồ Thị Gái			32	F	Pond culture
1.10	Đặng Thị Mẫn			46	F	Bottom nets, pond culture
1.11	Lê Thị Thu			35	F	Bottom nets, pond culture
2.1	Phan Công Chính	Quảng Ngạn	Thuy An	44	M	
2.2	Lê Nguyễn Phi			40	M	
2.3	Đặng Sửu			58	M	
2.4	Phan Bích			47	M	
2.5	Nguyễn Thị Thành			43	F	
2.6	Phan Hiếu			49	M	
2.7	Lê Văn Khuýnh			32	M	
3.1	Le Quang Trung	Quang Phuoc	Ha Do	43	M	
3.2	Dang Thi Le			33	F	
3.3	Hoang Thi Phung			50	F	
3.4	Bui Thi Ngoc Trang			36	F	
3.5	Hoang Kham			52	M	
3.6	Hoang Dung			45	M	
3.7	Vo Duong Hoa			48	M	
3.8	Duong Manh			40	M	
3.9	Dang Thuan			42	M	
3.10	Vo Le			45	M	

No	Full name	Commune	Village	Age	Gender	Fisheries activity
3.11	Vo Thi Diem			55	F	
3.12	Hoang Thi Din			55	F	
4.1	Nguyen Cuong	Quang Phuoc	Phuoc Lap	49	M	
4.2	Nguyen Van Ty			42	M	
4.3	Nguyen Van Deo			53	M	
4.4	Nguyen Van Me			35	M	
4.5	Tran Van Bot			65	M	
4.6	Ha Van Dan			32	M	
4.7	Nguyen Chiu			60	M	
4.8	Nguyen Thi Ben			57	F	
4.9	Hoang Thi Loan			27	F	
5.1	Phan Lan	Hai Duong	Thai Duong Ha Nam	54	M	Fish cage, shrimp pond
5.2	Huynh Nhom			51	M	Fish cage
5.3	Pham Don			45	M	Fish cage, capture/lift net
5.4	Phin Cay			51	M	Fish cage, shrimp pond
5.5	Pham Ngu			51	M	Fish cage, capture/bottom net
5.6	Pham Duc			37	M	Shrimp pond, fish cage
5.7	La Tai			35	M	Capture/bottom net, fish cage
5.8	Pham Co			47	M	Fish cage, shrimp pond
5.9	Pham Thuom			40	M	Capture/bottom net, fish cage, shrimp pond
5.10	Dang Quoc			39	M	Shrimp pond/fish cage
5.11	Pham Thao			49	M	Fish cage
5.12	Nguyen Nam			51	M	Fish cage
5.1	Ho Bach	Quang Cong	14	27	M	Trammel/gill net
5.2	Nguyen Tin			21	M	Trammel/gill net
5.3	Nguyen Thi Hien			26	F	Trammel net/labor work
5.4	Ho Du			37	M	Gill net
5.5	Tran Thi Ty			60	F	Trammel/gill net/fish pond (crab)
5.5	Tran Thi Be			35	F	Trammel/gill net
5.6	Pham Hoa			60	M	Shrimp pond
5.1	Tran Tich	Loc Binh	Hai Binh	55	M	Small capture, fresh water fish pond, mollusc culture in cage
5.2	Le Thi Hanh			54	F	Small capture, mollusc culture in cage
5.3	Nguyen Thi Giac			46	F	Small capture, mollusc culture in cage, fresh water fish pond
5.4	Nguyen Thi Choi			52	F	Fresh water fish pond, mollusc culture in cage, small capture,
5.5	Ha Thi Kinh			55	F	Small capture, fresh water fish pond, mollusc culture in cage

No	Full name	Commune	Village	Age	Gender	Fisheries activity
5.6	Nguyen Thuong			50	M	Agriculture, fresh water fish pond, mollusc culture in cage
5.7	Tran Thi Man			44	F	Small capture, mollusc culture in cage
5.8	Ha Thi Thien			37	F	Small capture, mollusc culture in cage
5.9	Le Viet Son			39	M	Agriculture, fresh water fish pond, mollusc culture in cage
5.10	Nguyen Tam			45	M	Small capture, mollusc culture in cage
5.11	Nguyen Nhat			41	M	Small capture, fresh water fish pond, mollusc culture in cage
5.1	Huynh Tre	Vinh Hung	Trung Hung	52	M	Bottom net, shrimp pond
5.2	Huynh Thanh			42	M	Bottom net, fish corral, shrimp pond
5.3	Duong Dung			59	M	Bottom net, fish corral, shrimp pond
5.4	Le Thi Lien			54	F	Bottom net, cast net, shrimp pond
5.5	Pham Thoa			55	F	Cage culture
5.6	Nguyen Van Den			55	M	Fish corral, cast net
5.7	Duong Tuong			52	M	Fish corral
5.8	Nguyen Van Toan			35	M	Fish corral, shrimp pond
5.9	Huynh Coi			56	M	Fish corral, cast net
5.10	Tran Hieu			50	M	Fish corral
5.11	Nguyen Thi Mat			41	F	Fish corral, shrimp pond
5.1	Hoang Dung	Quang Phuoc	Ha Do	47	M	Fish corral, shrimp pond
5.2	Tran Lu			40	M	Fish corral, shrimp pond
5.3	Duong Thi Xiem			49	F	Stake trap/Fish corral
5.4	Hoang Hue Kham			49	M	Stake trap, shrimp pond
5.5	Hoang Ten			52	M	Stake trap, shrimp pond
5.6	Duong Tu			32	M	Stake trap/fish corral
5.7	Duong That			45	M	Stake trap/Fish corral, shrimp pond
5.8	Hoang Khoi			52	M	Stake trap/Fish corral, shrimp pond
5.9	Le Hau			49	M	Stake trap/Fish corral, shrimp pond
5.10	Vo Thanh Diem			54	M	Stake trap/Fish corral, shrimp pond
5.11	Vo Le			55	M	Stake trap/Fish corral, shrimp pond

**Annex 6: Checklist of the Training needs and priorities at the district, commune and village level through On-Site TNA survey**

Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
Vinh Hien	Phu Loc	Hien Van II	3	3	Stake traps	<ul style="list-style-type: none"> <li>• Vocational training for labour export.</li> <li>• Training on market information access.</li> <li>• Training on access to bank credit.</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• Training on techniques to prolong life-span of stake traps.</li> <li>• Training on access to bank credit.</li> </ul>
		Hien An 1	4	5	Cage culture	<ul style="list-style-type: none"> <li>• Disease prevention and treatment methods for fish cages</li> <li>• Brackish-salt water fish culture.</li> <li>• Fingerling nursery techniques</li> <li>• Fish cage design and making</li> <li>• Fish cage system planning (distance among fish cages, and distance among households)</li> <li>• Brackish water fish raft culture</li> </ul>
Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
Loc Binh	Phu Loc	Tan Binh	7	3	Mollusc culture	<ul style="list-style-type: none"> <li>• Mollusc (oyster, clam and mussel) culture techniques</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• Capture: alternative livelihoods in replacement of destructive capture methods</li> </ul>
		Mai Gia Phuong	4	3	Pond culture	<ul style="list-style-type: none"> <li>• Integrated poly-culture</li> <li>• Freshwater aquaculture</li> <li>• Shrimp techniques</li> <li>• Treatment and prevention of shrimp and fish diseases</li> <li>• Techniques for selections of post-larvae</li> <li>• Fish-seed selection</li> </ul>

						<b>Others:</b> <ul style="list-style-type: none"> <li>• Knowledge in conservations of natural resources</li> <li>• Community awareness</li> <li>• Gender and community development</li> </ul>
Vinh Hung	Phu Loc	Trung Hung	3	3	Gillnet/trammel net	<ul style="list-style-type: none"> <li>• Training on credit information and access.</li> <li>• Training on the causes and prevention of pollution (for water intake/discharge) of pond.</li> </ul>
Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
		Phung Chanh	3	4	Pond culture	<ul style="list-style-type: none"> <li>• Feed maintenance techniques and feed proportion identification techniques</li> <li>• Prevention and treatment for white spots disease on shrimps</li> <li>• Fingerlings/pl selection techniques (various species)</li> <li>• Medicine used in aquaculture</li> </ul>
Vinh Xuan	Phu Vang	Mai Vinh	8	3	Pond culture	<ul style="list-style-type: none"> <li>• Aquaculture techniques</li> <li>• Shrimp diseases (WSD) prevention and treatment</li> <li>• Fingerlings selection</li> <li>• Post larvae selection techniques</li> <li>• Small scale Micro credit</li> <li>• Shrimp feeding techniques</li> </ul>
Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
		Xuan Thien Ha	3	3	Pond culture	<ul style="list-style-type: none"> <li>• Improved extensive aquaculture</li> <li>• Pond preparation techniques</li> <li>• Water quality test</li> <li>• Disease control and prevention</li> <li>• Feed processing for shrimp</li> </ul> <b>Others:</b>

						<ul style="list-style-type: none"> <li>• Conservation of natural resources</li> <li>• Establishment of fishery association in village</li> </ul>
Phu Xuan	Phu Vang	Thuy Dien	4	3	Net enclosure	<ul style="list-style-type: none"> <li>• Aquaculture techniques (species selection, stocking density, polyculture technique)</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• Fish processing</li> <li>• Financial planning management</li> </ul>
		Le Binh	5	3	Pond culture	<ul style="list-style-type: none"> <li>• Techniques for poly-culture</li> <li>• Construction and process of pond revival</li> <li>• Cage culture of different species of fishes</li> <li>• Techniques for mono-culture of shrimp</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• Livelihood generation for fish corral and mobile fishing households</li> <li>• Access to market information</li> </ul>
Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
Vinh Phu	Phu Vang	Group 16	4	3	Bottom net	<ul style="list-style-type: none"> <li>• Capital, micro credit management</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• Alternative livelihood for destructive fishing gears like gill net, Trammel net and bottom net and mobile fishing communities</li> </ul>
		Ha Bac	6	3	Pond culture	<ul style="list-style-type: none"> <li>• Pond preparation techniques</li> <li>• Shrimp raising techniques</li> <li>• Water quality test</li> </ul>
Huong Phong	Huong Tra	Thuan Hoa	3	3	Cage culture	<ul style="list-style-type: none"> <li>• Quality seed selection</li> <li>• Market information and market access</li> <li>• Control of water pollution</li> </ul>
		Van Quat Dong	5	3	Pond culture	<ul style="list-style-type: none"> <li>• Techniques for mitigation of such shrimp diseases as vàng mang (yellow gill), phân trắng (white excrement), đen mang (black gill)</li> </ul>

						<ul style="list-style-type: none"> <li>• Techniques for poly-culture of different stocks</li> <li>• Techniques for culture of cá Kinh, cá Tho; and the solutions to the issue of live feed.</li> <li>• Techniques for production of crab seeds.</li> <li>• Techniques for poly-culture cá trê, rôphi, cá chim trắng</li> </ul>
Hai Duong	Huong Tra	Thai Duong Ha Bac	7	1	Cage culture	<ul style="list-style-type: none"> <li>• <b>Shrimp culture techniques:</b></li> <li>• Shrimp feeding, shrimp feed</li> <li>• Shrimp disease prevention and treatment</li> <li>• Fingerlings selection technique</li> <li>• Nursery techniques in cage</li> </ul>
		Thai Duong Ha Nam	6	3	Pond culture	<ul style="list-style-type: none"> <li>• Raising (<i>siganus, serranidae, Lutjanidae</i>)</li> <li>• Polyculture techniques</li> <li>• Pond improvement techniques</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• Environment and resource conservation</li> <li>• Gender and community development</li> </ul>
Quang Ngan	Quang Dien	Thuy An	6	1	Bottom nets, Pond culture and stake traps	<ul style="list-style-type: none"> <li>• Techniques for reforming ponds.</li> <li>• Techniques for hatching shrimp seeds.</li> </ul>
Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
		Vinh Tan	8	3	Pond culture	<ul style="list-style-type: none"> <li>• Selection of quality seed</li> <li>• Market access and information</li> </ul> <p><b>Others:</b></p> <ul style="list-style-type: none"> <li>○ Market access and information</li> <li>○ Improved fisheries management</li> </ul>
Quang Phuoc	Quang Dien	Ha Do	6	5	Stake traps	<ul style="list-style-type: none"> <li>• Capture techniques of stake traps</li> <li>• Awareness on environmental management training of destructive fishing</li> <li>• Environment protection awareness raising</li> </ul>

		Phuoc Lap	7	2	Pond culture	<ul style="list-style-type: none"> <li>• Prevention and treatment of diseases</li> <li>• Monitoring and improve water quality</li> <li>• Post-larvae selection</li> <li>• Feed management</li> </ul>
Hai Duong	Huong Tra	Thai Duong Ha Nam	12	-	Cage culture	<ul style="list-style-type: none"> <li>• Fish cage culture techniques including fish disease control and preventions</li> <li>• Training on market information access.</li> <li>• Vocational training for employment</li> <li>• Business planning and management</li> </ul>
Quang Cong	Quang Dien	14	4	3	Gill net/trammel net	<ul style="list-style-type: none"> <li>• Fish cage culture techniques</li> <li>• Business planning and management</li> </ul>
Commune	District	Village	Gender		Target Activity	Training Needs and Priorities
			Male	Female		
Loc Binh	Phu Loc	Hai Binh	5	6	Mollusc culture	<ul style="list-style-type: none"> <li>• Mollusc cage culture techniques (snail <i>Babylonia sp</i> disease control and prevention)</li> <li>• Fish pond culture techniques (fish seed selection, Stocking density, feed, transportation and disease control)</li> <li>• Business planning and management</li> </ul>
Vinh Hung	Phu Loc	Trung Hung	8	3	Bottom net	<ul style="list-style-type: none"> <li>• Vocational training for the people which enable to get any other job opportunities as alternative livelihood</li> </ul>
Quang Phuoc	Quang Dien	Ha Do	10	1	Stake trap/fish corral	<ul style="list-style-type: none"> <li>• Shrimp pond techniques (Feed, stocking density, disease control)</li> <li>• Water quality and environment of shrimp pond</li> <li>• Business planning and management</li> </ul>

## **Annex 7: The identified list of training topics from 1st TNI Workshop at Dien Hai Commune (19-20 January 2006)**

### 1. AQUACULTURE

#### Shrimp farming in ponds

- Shrimp health management, disease prevention and mitigation
- Water quality monitoring and improvement

#### Fish farming in cages

- Selection of fry and fingerlings (species and quality) for cage culture
- Nursing of fry
- Fish health management, disease prevention and mitigation
- Feeding of fish (feed preparation, feeding practices and alternative feeds for small feed fish)

#### Fish farming in ponds

- Selection of fry and fingerlings (species and quality) for pond culture (including polyculture)
- Reproduction of species (hatchery operations and nursing of fry)
- Fish health management, disease prevention and mitigation
- Feeding of fish (feed preparation, feeding practices and alternative feeds for small feed fish)
- Water quality monitoring and improvement

### 2. FISH AND SHRIMP MARKETING

- Market intelligence/information provision (market prices and demand)
- Market regulations and demands from (domestic and international) consumers
- Quality maintenance and improvement (not urgent)

### 3. BUSINESS PLANNING AND MANAGEMENT

- Business plan development (to access credit)
- Record and bookkeeping for aquaculture farmers

### 4. LAGOON MANAGEMENT

- Organization of aquaculturists and fisherfolk (organization skills, establishment and maintenance of associations)
- Information provision on laws, decrees, regulations and plans with regards to the lagoon
- Planning for aquatic resource management
- Improvement of communication with government institutions
- Awareness raising on aquatic resource exploitation levels and sustainable practices
- Community based management skills