

# **Self-recruiting Species in Aquaculture: Their Role in Rural Livelihoods**

## **Case Study V8**

### **Tam Tang Village, Thang Loi Commune, Van Giang District**

#### **1. Introduction**

##### **1.1 Schedules and Persons Involved**

This study was carried out between May 31, June 26 and July 3, 2001. The RIA1-AIT team first visited the village on May 31 and worked on the PRA process on June 26 and July 3. After collating and translating information obtained at Tam Tang village on July 3, the team had a 'debriefing' with villagers on July 3. The RIA1 for the fieldwork consisted of

1. Kim Van Van
2. Nguyen Huu Hoa
3. Nguyen Chien Van
4. Bui Ngoc Thanh

##### **1.2 District Commune Description**

Van Giang district is the Northwest of Hung Yen province. It lies some 20 km Southeast of Hanoi city centre and a ridge of Red river. The total area of the district is 71.79 km<sup>2</sup> and the population 92,000 people. Despite its location, **Most** of the households of the district are engaged in agriculture and the average per capita income of the district is a rather low VND 3.02 million (US\$208). Increasing in economic is about 8%. 5,05% of the households in the district are classified as poor (old criteria).

The district was chosen as representative of the delta fringe and riverside dike ponds of the Red River delta. The district slopes steadily from west to east (from dike to field). The western edge of the district in fact has a dike of Red River with 6 communes lie alongside the Red river and suffer from over bank flooding from the river and 5 others in the field. It was decided to select three villages from two communes along a transect from west to east (from out of dike to inside dike). Tam Tang village of Thang Loi commune lies out dike and near the river, Phu Dinh of Thang Loi commune sit two sides of Red river dike and Vinh Tuy village of Lien Nghia commune is in the field. The characteristics of two communes are summarised in Table 1.

Table 1: Natural and Social-Economic Characteristics of Selected Communes

Variable	Thang Loi Commune	Lien Nghia Commune
Topography	Out and on side of dike	On and in side of dike
Total Area (km <sup>2</sup> )	4.83	5.27
Land Area (ha)	No data	500
Agricultural Area (ha)	197	319
Agriculture Households (%)	98	100
Population Density (person /km <sup>2</sup> )	1335	1594
Poor Households (%)	7	3
Average income VND mil. / person	2.5	5.3
Water Surface Area Used (ha)	36.06	40.31
Water Surface Area Unused (ha)	115.53	21.28
Aquaculture Systems	Semi-intensive, Extention	Semi-intensive, Extention
Species culture	Grass car, Silver carp, Common carp, Indian carp	Grass car, Silver carp, Common carp, Indian carp
Wild fish	Hel. river catfish, shrimp	Crab, <i>Carissius auratus</i> , <i>Anabastes</i> .

Source: Van Giang Agriculture and Rural Development; Selected Commune Offices. In 2000-2001

Notes from commune meeting

### 1.3 Selection Process for the Village

Once the tentative commune sample framework had been established, the RIA1-AIT team began its work by making an appointment with Mr Kien, a staff of the District Department of Agriculture and Rural Development (DARD) in Van Giang district for the afternoon of May 31. A meeting was hold in DARD office. Mr. Kien said that the land around dike is higher than land in field so that most communes side dike concentrated in field crop and fruit tree plant. The communes in the field concentrated rice cultivation. Then a visitation to Thang loi commune and some other communes. An introduction to Mr. Nguyen Van Hai, chairman and Mr. Thieu Van Vuong, Land management of Thang Loi People's Committee, details of the constituent villages of the commune were obtained. Thang Loi Commune comprised 9 villages as follows:

- |                 |              |
|-----------------|--------------|
| 1. Phu Bai      | 150 families |
| 2. Phu Thuong   | 220 families |
| 3. Phu Dinh     | 120 families |
| 4. Tan Loi      | 120 families |
| 5. Duong Thuong | 120 families |
| 6. Duong Ha     | 160 families |
| 7. Xam Trong    | 195 families |
| 8. Xam Hong     | 200 families |
| 9. Tam Tang     | 140 families |

All villages have not rice cultivation, but only field crop, ornament tree and fruit plant. It was stated that Tam Tang and Phu Dinh villages contained large number of poor

households. Tam Tang village lies ridge of Red river (out side of dike) and Phu Ding village sits two sides of dike. The size of the villages was suitable for PRA. One of these, Tam Tang, and Phu Dinh were chosen.

The team secured an appointment with village leaders in Phu Dinh including

1. Mr. Nguyen Van Loan (Village Head)
2. Mr. Thieu Duc Vuong (Land management)

On the basis of which an appointment was made to begin work on June 26.

## **2. Setting the Context**

### **2.1 Mapping the Current Resource Context**

Figure 2.1 presents the village resource map. This was drawn by Mr. Nguyen Hong Son, a commune guard in his house where the meeting was taking place. Phu Dinh village sits on two sides of Red river dike and surrounded concentrically by field crops and fruit trees. The roads, school, pagoda, people committee, electric box, slopes, dyke, lime kiln, field crop, canals, kindergarten and communal house are shown. The main area of aquaculture, lake, canals and ponds also appear to be in this part of the village. Map of Phu Dinh Village is very detail.

### **2.2 Mapping the Development of the Village (Timeline)**

Figure 2.2 shows the timeline of key points in the village development. Information was supplied by Mr. Nguyen Van Chuoi, and Mr. Nguyen Van Loan. They stressed political events. Most events as fighting with Japanese, French and American were often mentioned in Phu Dinh village in 1945, 1946, 1948, 1950, 1952 and 1972. Due to sitting on the dike so that events as high water level was also emphasised in 1969 and 1971. The economic item of note mentioned, was the foundation of the co-operative in 1956, helping groups were established, at this point the co-operative took control of the land and the whole village worked together and divided the production evenly and in 1996 the government distributed land to individual farm households. The policies for using land were also changed, but the living standard of people have started improving from 1996 due to changing suitable plants as mint, fruit plant, medicine tree, etc. The communal house and pagoda of the village were repaired in 1991 and in 1993 electricity reached the village.

## 2.3 Mapping the Social Context: Well-being Ranking and Criteria

### Well Being Ranking Criteria

Rank	Trial 1	Trial 2	Trial 3
	Nguyen Van Chuoi Nguyen Van Loan	Nguyen Thi Thuyet Mr. Son's wife	Mr. Kien + Mr. Son
1	Poor Economic, but still enough food. Poor knowledge Addicting Lack of furniture Their children intend to be bad	Old and a lone Small houses Almost no furniture Economic is bad	Many children & Addicting Often meet risks
2	Some people have many children Some HHs get risks Poor knowledge Only agriculture Have cheap furniture Small houses & land Some HH have B - W TV or domestic	Some HH just get married & separated from big families or young kids Almost have not TV Small houses and lack of labor	Poor economic & get risks. Have small houses Some HH have B-W or domestic TV Lack of labor or living alone
3	Fine economic Some HH have large house, 60% of them have color TV and motorbike Clever mind in livelihoods Their child intend to be good	Enough labor Have normal houses Almost people have TV	Economy is better than group 2 but no stable Have just separated with young kids. House is level 4, 80% of HHs have TV
4	For economic and cultural of this group are good Flat roof or two floors. 100% of HHs have Color TV, some HHs have motorbike. Have income from other resources Often fruit plant or ornamental plant	Have flat roof, motorbike, tractor and color TV Good knowledge Their children went out to work Have other income from out agriculture Good business Good health	Stable & develop economic Good health & children have good conditions for studying Have other income from out agriculture Most HH have flat roof. 100% HHs have color TV & 95% HHs have motorbike

5	Good knowledge in business, have car, tractor, motorbike Their children are studying in university Two floors	Good economic Almost children are successful Some HHs have car	Good economic, spare money, some HHs have car. Their children are successful Have beautiful houses as flat roof, two floors.
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- Social Structure of the Community: Community includes 9 villages, each village has some groups. The positions in community: Chairman, vice chairman, accountant, chairman of party labour, vice chairman party labour, Young union, Women Union, Old People union & Army Union. The positions of persons in each village are the same, but at level of village.

## 2.4 Summary/ Key Points

- Phu Dinh village sits on two sides of Red river dike surrounded concentrically by delta with field crop and fruit trees.
- Field crop of the village often occurs flooding in rainy season.
- Wealth Ranking criteria:
  - Poor Households:
    - + Lack of knowledge, often old live a lone, get risks in working, addicting and many children.
    - + Enough food, small land, small, simple or temperate houses, lack money, facilities, furniture, farm equipment & investment.
    - + Their children often stop learning early.
  - Fairly Poor:
    - + Old people, live a lone, young couples, young kids, many children, get some risks in working
    - + Have a house & simple materials but still lack investment.
    - + Have some money, no table economic, normal income from agriculture.
  - Medium:
    - + Enough money, 60-80% HHs have TV, have normal furniture, and houses, enough labour and investment.
    - + Their children often finish secondary school.
  - Fairly Rich:
    - + Fairly good economic, stable and develop economic, have other income resources from ornamental or fruit tree.
    - + Know how to produce, 100% HHs have colour TV, some HHs have flat roof of houses, 95% HH have motorbike, have good and expensive furniture.
    - + Good conditions for children studying and good health.
  - Rich Households:
    - + Good economic, good knowledge in business, big investment, their children can go to high education, college or university.
    - + Good materials, beautiful houses, even car, tractor, telephone, and spare some money.

+ Most of them get other income out of agriculture.

### **3. Activity Profile of the Village**

#### **3.1 Seasonal Calendar**

Figures 3.1–3.4 present the annual calendar of activities for the different social groups in the village. There are small but not significant differences in the perception of the weather, with some groups emphasising temperature and others rainfall, storm or wind. Nor are the differences in the social events mentioned events mentioned especially significant; it may be noted that there are festivals and ceremonies in almost every month, some of them traditional, others promoted by the state.

In relation to economic activities, the calendar for all groups shows no rice cultivation being practised. All groups are engaged in field crop cultivation. Maize, beans and peanuts are planted in February and harvested in May-June; where no flooding could have second maize crop or one tomato and vegetable crop in winter is planted in September, October and harvested in December, January, this crop is after flooding season. Fruit plants as small apple, orange, kumquat and medicine tree are planted in February, March and harvested in November, December and January. But Guava and jamboree are harvested in May-July. Fish are stocked in February-April and harvested in December-January, around Tet holiday. Fishing is mentioned by rich men group.

All groups were also engaged in livestock cultivation, although the poorer households have less number of chickens, duck and pig than rich people. It was shown in flocks, with the poor concentrating on rearing of pigs, duck and chickens, while the better off had a wider range of stock including cattle.

From this analysis, there are clear peaks in the labor demands and income flow from agriculture. Families are extremely busy in May, June for harvesting soil bean and maize and November, December-January for vegetable crop, while the main income streams appear particularly concentrated in May-June and December-January, especially just before the Tet New Year. Interestingly poor men claim to be busy throughout the year except flooding season. All groups mentioned wage labour in Bat Trang ceramic village. All groups mentioned tired, fever in summer and changing weather, cold, cough, asthma, lung inflammation and rheumatism in children in winter.

### 3.2 Group Activity Profile

Some of these differences are reflected in the group activity profiles.

#### Poor Women

<b>Activities</b> \ <b>Name</b>	<b>Nguyen Thi Xuyen</b>	<b>Le Thi Lien</b>	<b>Nguyen Thi Hanh</b>	<b>Total</b>	<b>Rank</b>
Crop fields	6	5	6	17	<b>1</b>
Livestock	2	3	2	7	<b>4</b>
Garden (Fruit plants)		2	1	3	<b>6</b>
Medicine plants		1	1	2	<b>7</b>
Wage labour	3	6	6	15	<b>2</b>
Take care children	4	3	4	11	<b>3</b>
Small trade	<b>5</b>			5	<b>5</b>
<b>Total</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>60</b>	

#### Poor Men

<b>Activities</b> \ <b>Name</b>	<b>Nguyen Van Chuyen</b>	<b>Nguyen Van Thuan</b>	<b>Le Xuan Di</b>	<b>Bui Van Quang</b>	<b>Nguyen Van Minh</b>	<b>Total</b>
Field crop	3	5	3	6	7	<b>24</b>
Fruit plants	4	5	6	4	4	<b>23</b>
Livestock	3	6	3	5	5	<b>22</b>
Culturing fishes	5					<b>5</b>
Take care children	4	4	6	5	4	<b>23</b>
Wage labour and salary	1		2			<b>3</b>
<b>Total</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>100</b>

#### Rich Women

<b>Activities</b> \ <b>Name</b>	<b>Nguyen Thi My</b>	<b>Nguyen Thi Hoi</b>	<b>Thieu Thi Hang</b>	<b>Nguyen Thi Tuyen</b>	<b>Nguyen Thi San</b>	<b>Le Thi Thung</b>	<b>Total</b>
Field crop	4	4	8	4	2	2	<b>28</b>

Livestock	3	5	5	4	2	6	<b>25</b>
Fruit plants	7	6	2	5	11	3	<b>34</b>
Fish Culture	1						<b>1</b>
Medicine plants	1	1	1	2	1	2	<b>8</b>
Wage labour							
Take care children	4	3	4	4	4		<b>19</b>
Business		1		1		7	<b>9</b>
<b>Total</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>100</b>

### Rich Men

<b>Name</b> <b>Activities</b>	Nguyen Van Dao	§ang Van Quynh	Bui Van Vang	Bui Van Cuong	Nguyen Van Thuyet	<b>Total</b>
Field crop	6	4	4	7	3	<b>24</b>
Livestock	5	3	2	4		<b>14</b>
Fruit plants	3	4	6	3	2	<b>18</b>
Fish culture		4	3			<b>7</b>
Fishing	1		1			<b>2</b>
Medicine plants	4	4	3	4	4	<b>19</b>
Take care children	1	1	1	2	2	<b>7</b>
Business					9	<b>9</b>
<b>Total</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>100</b>

These are summarised in Table 3.1. It will be noted that all households rank field crop growing high on the list after that is fruit plants, but poor women rank wage labour highly. Take care children is not emphasised so much. They place relatively little importance on wage labour. This activity is only mentioned by poor groups, although all groups mentioned it in economic activities when ranking they forget it.

**Table 3.1. Activities summary:**

<b>Poor Women</b>	<b>Poor Men</b>	<b>Rich Women</b>	<b>Rich Men</b>
1. Field crop	1. Field crop	1. Fruit plants	1. Field crop
2. Wage labor	2. Fruit plants	2. Field crop	2. Medicine plants
3. Take care children	3. Take care children	3. Livestock	3. Fruit plants
4. Livestock	4. Livestock	4. Take care children	4. Livestock
5. Trading	5. Fish culture	5. Trading	5. Trading
6. Fruit plants	6. Wage labor	6. Medicine plant	6. Fish culture
7. Medicine plant		7. Fish culture	7. Take care children
			8. Fishing



Several other points are worth noting. These include:

- The important of field crop and fruit tree for most groups is related to the colonisation. The difference with other places, fruit tree is planted in field lump this with field crop and medicine trees. For take care children, all groups mentioned it is not important. Fishing is only mentioned by rich men group. Fish culture is mentioned by most groups as poor men and rich groups but not high rank on the list.
- The fact that fruit tree for poorer women tended less important than in poor men and rich groups.
- For wage labour activity is important in this area for poor women group but not important for other groups. Because with field crop activity need more time than other activities, so that most of time in all year is busy except flooding season as poor men group mentioned.
- Between poor & rich group have difference opinions about livestock: poor group concern to pig and rich group concern to cattle, pig, chicken & duck and with high number of animals. Because for poor people lack investment.
- The overall low ranking of fish culture and fishing, only rich group mentions fishing.

#### 4. Role of Aquatic Animals

##### 4.1 Species Ranking

Figures 4.1-4.4 present the ranking of the main aquatic animals according to their importance in livelihood by the different groups (poorer men, poorer women, better-off men; better-off women) in the village. On the basic aquatic animal species were supported by all groups. Six highest important aquatic animal species were chosen.

**Figure 4.1: Poor Women**

<b>Criteria Species</b>	Availab le	<b>Few bone s</b>	<b>Easy catc h</b>	<b>Grow fast</b>	<b>Chea p</b>	<b>High valu e</b>	Delici ous	<b>Tota l</b>
<i>He. leucisculus</i>	3	1	4		5	4	2	<b>19</b>
<i>Clupanodon</i> sp.	2	1	3			4	2	<b>12</b>
Snail	2	3	4		4		1	<b>14</b>
Grass carp	1	3	2	3	1	3	2	<b>15</b>
Silver carp	1	1	1	3	5	2		<b>13</b>
Indian carp	1	1		1	2	3	2	<b>10</b>
Water Snake	1	4	1			1		<b>7</b>
<i>O. pagalense</i>	2	4	1			2	2	<b>11</b>
Common carp	2	2	1			2	2	<b>9</b>
Shrimp	4		4			2	3	<b>13</b>
Crab	2	3	3		4		1	<b>13</b>

Big FW Clam		3	5		4		1	13
Snake head	2	5	1				3	11
Clarias Catfish	1	5	2	3			3	14
<i>Ca. sinensis</i>	4	3	3			2	3	15
<i>Anabas tes.</i>	1	1	3	1	5			11
<b>Total</b>	<b>29</b>	<b>40</b>	<b>38</b>	<b>11</b>	<b>30</b>	<b>25</b>	<b>27</b>	<b>200</b>

**Figure 4.2: Poor Men**

<del>Criteria Species</del>	Gro w fas t	Few bones	Delici ous	Availa ble	Suita ble money	Less diseas e	<b>Total</b>
Grass carp	5	2	3	3	2		15
Indian carp	2	2	4	4	5	2	19
Silver carp	4		2	5	5	4	20
Common carp	2	3	6	3	2	3	19
Shrimp		5	5	2	1		13
Crab		2	3	3	2		10
Frog and Eel		5	3	1			9
<i>Mis. fossilis</i>		3	4	1			8
Water snake		2	3	1			6
Snail		2	2	3	3		10
Clarias Catfish	2	2	3	1			8
<i>Anabas tes.</i>			2	4	3		9
<i>Ca. auratus</i>			1	4	3		8
River catfish		2	3	1	3		9
<i>Cra. sinensis</i>		2	2	4	2		10
Soft turtle		2	5				7
<i>He. leucisculus</i>			3	5	5		13
<i>Clupanodon</i> sp.			4	1	2		7
<b>Total</b>	<b>15</b>	<b>34</b>	<b>58</b>	<b>46</b>	<b>38</b>	<b>9</b>	<b>200</b>

**Figure 4.3: Rich Women**

<del>Criteria</del>	Avai	Eas	Eas	Easy	High	Chea	Eas	Few	<b>Tota</b>
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Species	lable	y buy	y sel l	cult ure	nutri tion	p	y cat ch	bone s	l
<i>O. pagalense</i>	1	1	2		4			1	9
Common carp	2	3	3	2	4		1		15
Small eel			1		3			1	5
River catfish	2	2	2		3		1	1	11
Clarias catfish	1	2	2	1	4		1		11
Snail	2	3	3		4	1	2		15
Crab	2	3	3		4	1	2		15
Silver carp	3	3	3	6	3	1	2		21
Shrimp	1	1	3		3		2		10
Indian carp	3	2	2	5	3		2		17
Grass carp	3	2	2	5	3		2		17
<i>Ca. auratus</i>	2	1	1		1	1	1		7
Snake head	1	1	2		2			1	7
<i>Anabas</i> tes.	1	1	1		3				6
Big FW Clam	1	1	1		2	1	1		7
Frog			2		2				4
<i>Squ. .sp</i>	1	1	1		2				5
<i>He. leucisculus</i>	1	1	1						3
<i>Glo. giuris</i>			1		2				3
Tilapia		2	2	1	1				6
S. wild fish	1	1	1		1	1	1		6
<b>Total</b>	<b>28</b>	<b>31</b>	<b>39</b>	<b>20</b>	<b>54</b>	<b>6</b>	<b>18</b>	<b>4</b>	<b>200</b>

**Figure 4. 4: Rich Men**

Criteria Species	Delicious	Availabl e	Easy catc h	Chea p	Few bone s	Easy cultu re	Easy buy	Total
Silver carp		2	3	3		3	4	15
Clams, snail	2	2	2	1	1		4	12

<i>He. leucisculus</i>		1	1	2	1		2	7
<i>Mis. fossilis</i>	3	2	1		3		2	11
<i>Clupanodon sp.</i>	3		1	1			2	7
<i>Cra. sinensis</i>	2	1	1	1	2		1	8
<i>Mugil cephalus</i>	2		1	1			1	5
Cynoglossus sp.	3			1	3		1	8
Shrimp	2	1	1		3		1	8
Common carp	2	2	1		1	1	1	8
Snake head	4	1	1		3		1	10
River catfish	3	1	1		3		1	9
<i>Pse. fulvibraco</i>	3	1	1		2		1	8
Indian carp	1	1			2	2	2	8
<i>Anabas tes.</i>		3	2	2			5	12
§ing §ôc	2	1	1	1	1		1	7
Squ. <i>curriculum</i>	2	1	1	1			1	6
<i>Mac. reevessi</i>	3		1	1	2		1	8
Clarias catfish	2	1	1		2	1	1	8
Crab	1	1	1	1	1		1	6
<i>He. elongatus</i>	3	1	1	1	2		1	9
Grass carp	2	1	1		2	1	1	8
<i>Car. auratus</i>		2	3	2			5	12
<b>Total</b>	<b>45</b>	<b>26</b>	<b>27</b>	<b>19</b>	<b>34</b>	<b>8</b>	<b>41</b>	<b>200</b>

It will immediately be apparent that the ranking is different between groups. But generally, most groups like silver carp and grass carp. Poor people mentioned shrimp and rich people mentioned snail, rich men emphasised some wild species often used when drinking. But poor men and rich women group emphasised fish culture.

For criteria, most groups mentioned available, few bones, cheap, delicious and easy catch. They could catch wild fish in river.

### **Important Aquatic Animals - Summary:**

Poor Women 16 Species	Poor Men 19 Species	Rich Women 21 Species	Rich Men 16 Species
1. <i>Hem. leucisculus</i>	1. Silver carp	1. Silver carp	1. Silver carp
2. Grass carp	2. Indian carp	2. Indian carp	2. <i>Anabas tes.</i>
3. <i>Cra. sinensis</i>	3. Common carp	3. Grass carp	3. <i>Car. auratus</i>
4. Clarias catfish	4. Grass carp	4. Common carp	4. Clam, Snail
5. <i>Clupannodon sp.</i>	5. Shrimp	5. Snail	5. <i>Mis. fossilis</i>
6. Shrimp	6. <i>Hem. leucisculus</i>	6. Crab	6. Snake head

### Important Criteria - Summary

Reasons	Criteria	Poor		Rich	
		Women	Men	Women	Men
<b>Consume</b>	Available	29	46	28	26
	Few bones	40	34	4	34
	Cheap	30		6	19
	Delicious	27	58		45
	Suitable price		38		
	Easy catch	38		18	27
	Easy buy			31	41
	High Nutrient			54	
<b>Culture</b>	Grow fast	11	15		
	Easy culture			20	8
	Easy sell			39	
	High value	25			
	Less disease		9		

### 5. Aquatic Animal Seasonality and Trends

From figure 5.1-5.4 shown that most groups like cultured fish due to cheap, available, tasty. Most groups mentioned that they bought more fish in spring and winter, this point is suitable with stocking and harvesting season. Except silver carp is less bought in early of year due to customer. The price of silver carp is cheaper in early of month and of year and more expensive in the end of month, of year. This area has very few people could catch wild fish due to field crop area, the land is very high so that there is not much wild fish.

### 6. Aquatic Animal Trends

#### Poor Old Women

Periods Species	Before 1960	60-70	70-80	80-90	90-95	95-2000	After 00
<i>Hemiculter leucisculus</i>	In			Dec.			
Grass carp	Dec. lack of seed to culture	In. due to develop seed, even environment was bad but it still develop					
<i>Cranoglanis sinensis</i>	In. less use poison chemical so environment was not polluted					Dec. Excessive exploitation caused destroyed	
Catfish	In			Dec.	In. cultured more		Dec. by disease
<i>Clupanodon sp.</i>	In. No use poison chemical in agriculture				Dec. caught by electric shock resource water was polluted		
Shrimp	In. less use poison chemical so environment was not polluted					Dec. Excessive exploitation caused destroyed	

#### Poor Men

Period Species	Before 60	60-70	70-80	80-90	90-95	95-2000	After 2000
Silver carp	Stable		In. cultured more				
Indian carp	Stable		In. cultured more				
Common carp	Stable, the yield is not high						
Grass carp	Stable			In cultured more		Dec., effected by disease	
Shrimp	In			Stable	Dec Polluted environment		
<i>Hemiculter leucisculus</i>	In			Stable	Dec Polluted environment		

#### Rich Women

Periods Species	Before 1960	75	90	2000
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Silver carp	Stable A lot of nature lake and lagoon, good environment, less exploited	Dec By dyke system stopped migration of fish, area surface was decreased	In have a lot of experience in producing process, apply advance of science in aquaculture
Indian carp *	Stable A lot of nature lake and lagoon, good environment, less exploited	Dec By dyke system stopped migration of fish, area surface was decreased	In have a lot of experience in producing process, apply advance of science in aquaculture
Grass carp *	Stable A lot of nature lake and lagoon, good environment, less exploited	Dec By dyke system stopped migration of fish, area surface was decreased	In have a lot of experience in producing process, apply advance of science in aquaculture
Common carp **	Stable A lot of nature lake and lagoon, good environment, less exploited	Dec By dyke system stopped migration of fish, area surface was decreased	In have a lot of experience in producing process, apply advance of science in aquaculture
Snail **	Stable	Dec Excessive exploitation, polluted environment, area surface extremely decrease	
Crab **	Stable	Dec Excessive exploitation, polluted environment, area surface extremely decrease	

## Rich Men

Species	Period Before 60	80 2000 After 00
Silver carp	Stable by natural environment	
<i>Anabass tes.</i>	Stable by natural environment	
<i>Carasius auratus</i>	Stable by natural environment	
Clam, snail	Stable Few people caught	Stable Surface is being contacted to lake and lagoon lords
<i>Mastascembelus aculeatus</i>	In Few people caught	Dec Many people catch by a lot of kind
Snakhead	Stable	Dec By snake head eaten fingerling

Most groups in the village like cultured fish and some of wild fish as shrimp and Hem. *leucisculus* were mentioned by poor people, but recently wild fish have been decreasing due to many people catch and using damaged equipment as electric shock and polluted environment. Most groups mentioned that fish culture are increasing due to develop seed & technique, but for poor men mentioned that grass carp is also reducing due to polluted environment and disease.

## 7. Cross checking



## 7.1 Transect Walk

Land manager and head of village taken us to around the village with the map and shown lime kiln, pagoda, dike, slopes of dike, school, kindergarten, committee's people, field crop, ponds, people living, ponds and canals have wild fish & where water resource over flooding to and where they could catch wild fish.

## 7.2 Farmer meeting

- Shown the map of their village which some people had drawn one week ago and required them shown some places and asked them which parts were not correct, please drawn up. After that summary their activities and which aquatic animal they like & some questions were talked out:

- All groups have not rice cultivation and only field crop. This activity includes medicine tree, fruit plant and vegetable. This activity is a main income activity in this area for all groups. Livestock is less important activity in this area. During fruit planted tree brought high income. This village lies near Industrial Bat Trang ceramic zone, so that many people come there to find work in free time. The village lies near Red river with field crop activity so they are busy all year except flooding season. This area, fruit trees are planted in garden and medicine trees are planted under fruit trees.

- Poor women liked buy wild fish, rich people liked silver carp due to cheap price, easy culture, but rich women emphasised that they don't like silver carp in early of month, of year due to customer and they often buy Indian carp and silver carp in other time of year. Rich men mentioned that they liked *Mastascembelus aculeatus*, but at the moment this species is rapid reducing due to its value.

## 8. Summary/ Key Points

- Most of groups have same ideas about weather as temperature, rain, sun, wind and storm, about social events as mid month, In. women day, festival, kill insect day, children new year and Tet.
- All groups have not rice cultivation activity
- The most important activity is field crop includes medicine tree, fruit plant and vegetable. Fruit and medicine trees are planted in February and harvested in the end of year, maize, soil bean are also planted in February and harvested in May-June. Vegetables are planted and harvested in winter season.
- Most groups mentioned fish culture and fishing is only mentioned by rich men.
- Almost groups like cultured fish due to available, tasty and fit price as silver carp, Indian carp, grass carp and common carp. Wild fish is reducing and fish culture are increasing, but for poor men mentioned grass carp is reducing due to pollute environment and disease.