

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

Case Study V6:

Trai Village, Van Tu Commune, Phu Xuyen District

1. Introduction

1.1 Schedules and Persons Involved

This study was carried out between June 2 and June 27-28, 2001. The RIA-AIT team first visited the commune on June 2 and worked on the PRA process on June 27-28. After collating and translating information obtained at RIA1 in evening June 27, the team has a 'debriefing' with villagers in evening of June 28. The RIA1 for the fieldwork consisted of:

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

1.2 District Commune Description

Phu Xuyen district is the Southern district of Hanoi City. It lies some 60 km South of Hanoi city centre and surrounds river system. The total area of the district is 170.88 km² and the population 179,238 people. Despite its location, 91.74% of the households of the district are engaged in agriculture and the average per capita income of the district is a rather low VND2.659 million (US\$183.4). 4.94% of the households in the district are classified as poor.

The district was chosen as representative of the low land of the Red River delta. The district slopes from east to west. The eastern edge of the district in fact has Red river, rising to around 3 m above sea level. Six communes concentrated bid-rent large ponds, three communes are poor, six communes often have been over flooding in rainy season, Contrary six commune often get drought. It was decided to select three communes along a transect from east to west, Quang Lang in the draught area beside dyke of red river; Tri Thuy in the intermediate lowland areas and Van Tu in the lowest lying area of district. The characteristics of these communes are summarised in Table 1.

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

Variable	Quang Lang Commune	Tri Thuy Commune	Van Tu Commune
Topography	High land	Lowland	Lowest land
Total Area (km ²)	6.5795	5.15	6.47
Land Area (ha)		328.4	427
Agricultural Area (ha)	327.52		391
Agricultural Households (%)	98.92	96.5	89.07
Population Density	797	1317 (1994)	683 (1995)
Poor Households (%)	5 new	10 new	5-6 new
Water Surface Area Used (ha)	54.6	15	43.2
Water Surface Area Unused (ha)	Red river	0	0
Aquaculture Systems	Extensive	Extensive	Extensive & semi-intensive
Species	Grass, silver, common and Indian carps	Grass, silver, common and Indian carps	Grass, silver, common and Indian carps
Wild fish	Wild fish from river	From field & river	From field

Source: Phu Xuyen Departments of Statistics and Agriculture and Rural Development; Selected Commune Offices.

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 Le Xuan Thuy, the staff of Phu Xuyen district department of agriculture and rural development in Phu Xuyen district for the morning of June 2. He took up us to Quang Lang, Tri Thuy, Van Tu and other communes in the district. An introduction to Mr. Nguyen Van Bang, Chairman of Van Tu commune, Phu Xuyen district . A meeting between RIA 1 team with Van Tu commune staff include: the chairman, Head of Trai village and Mr. Tuyen land manager of the commune in the morning of June 27, details of the constituent villages of the commune were obtained. The commune comprised 9 villages as follows:

1. Thuong	290 families
2. Ung Cu	164 families
3. Vuc	138 families
4. Chinh	79 families
5. Trung	76 families
6. Chan	132 families
7. Cuu	137 families
8. Thuan	152 families
9. Trai	195 families

Trai village is poorest village. They have lowest land, average land area for each person in the village is for 700 m² smaller average land in the commune and often over flooding in rainy season so that difficult for rice cultivation in Autumn - Summer. Main land area for rice cultivation, less land for field cultivation and field crop is only maize plant in winter crop. This area used one rice cultivation crop, but now they can plant two

rice crops. The commune have 5% poor households. Mr. Bang introduced to Mr. Nguyen Van Si, head of Trai village and Mr. Tuyen, land manager of commune. The team immediately secured an appointment with village leaders in Trai including:

1. Nguyen Van Si, Head of village
2. Duong Van Hoat, Party labour
3. Nguyen Thi Luan, Women Union.

The size of the village was a constraint for PRA. So that part of village was a suitable for PRA. One of these, Trai was then chosen. On the basis of which an appointment was made to begin work that same afternoon.

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 Van Sy, head of Trai village, the meeting was taking place in party labour's house. Trai village sits on dyke of Nhue river and surrounded concentrically by low fields. Two pump stations and temple are appeared in this. The main area of aquaculture ponds also appears to be in this part of the village.

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. Duong Van Hoat, old head of the village and Mr. Nguyen Van Sang, Chairman of labour party. They stressed political events. The village was established 1976, at the time there were 25 fish men households in total 120 households. This is a new village. By 1979 agriculture co-operative was established and all small co-operative were cancelled including fish co-operative. Nhue river dyke was broken in the head and the end of the village in 1985, but hadn't damaged so much. By 1989, rice field was divided to households for 1-2 year/ time. Electric was installed in 1991 and until 1993 the land was divided long time for each families. In this commune had new policy for changing many small land species in many places into big land species in the same place in 1997. This policy made easier for using land and more benefit. The cultural house was built in 1998 and road of the village was built in 1999. At the time PRA process the village has a lot people involved with main job in fishing.

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

Well-Being Ranking Criteria

Rank	Trial 1	Trial 2	Trial 3
	Nguyen Van Sy Head of village	Nguyen Thi Luan Village Women Union	Nguyen Van Tham Duong Van Hoat
1	Lack food 3 - 4 months/year, simple furniture, a lot children, poor health, poor knowledge, their children stop study at grade 3, 4, 5, livelihoods by fishing (catch crab, snail etc.)	Poor economic, a large loan, simple houses, their children stop learning at level 1, don't know accountant, households have not finished level 1 of school, fishing, wage labour, lack furniture.	Poor economic, poor knowledge, studying at grade 2, 3, small houses, their children stop learning at grade 3-4-5, lack food 3-4 months/year, catch crab, snail to earn money, Lack investment
2	Better knowledge than G1. Lack food near the time harvest for 1- 2 months, lack investment, limitation about understand technique, old & weak, spent more than income, 20% of HHs have B & W TV or domestic. Plenty young HH have just get married & separated from big families.	Have some furniture, Most HH have not TV, box. 80% of children have not finished level 1 of school, a little knowledge for working.	Lack food for 1- 2 months/year, Many young HHs just separated from big families, no inherit from parent, lack furniture and investment.
3	Enough food, know how to work, understand technique, their children studying in level 2 or finish secondary school, normal houses. 80% of HHs have TV.	Have furniture, sewing machine, and casting net, net, handicraft equipment & sub work. 70% of HHs have TV (50% color TV, 20% B & W TV)	Stable economic. 90% HHs have TV, 80% HHs have enough furniture, good knowledge for work, their children finished level 2 of school.

4	Have sub work & inherit from parent, basic job (sewing, boss of sewing) good income, good knowledge, normal children, good health.	Know how to work, good knowledge. Have farm equipment, enough furniture, good health, their children finished studying at level 2 (secondary school).	Fairly good economic, have sub work, boss of sewing machine, have motorbike, good knowledge for working, their children finished studying at secondary school.
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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

- Trai village sits on a ridge of Nhue river surrounded concentrically by fields and paddy land.
- The village has been established for 25 years & developing. Several people have fishing in livelihoods.
- Well-Being Ranking criteria:
 - Poor Households:
 - + Many children or poor health, simple houses.
 - + Lack of: food about 3-4 months/year, so that livelihoods by fishing.
 - + Their children stop learnt early at grade 3-4-5, even households had not finished primary school also
 - + Households have poor knowledge, don't know accountant. Lack of facilities, furniture, farm equipment & investment.
 - Fairly Poor:
 - + Have a house & simple and cheap materials but still lack investment, low knowledge. 20% households have W & B TV
 - + Lack food 1-2 months/year
 - + Households often are old & weak or young couple just separated from big families without inherit. They spent more than income, have limited about understand, a little knowledge for working. 80% children have not finished primary school due to the school is far from the village and limited by Nhue river.
 - Medium:
 - + Enough food, stable economic. Have normal farm equipment, facilities, furniture and normal houses. 70-90% households have TV (2/3 is color Tv and another is W & B TV)
 - + Their children often stop at secondary school.
 - Rich Households:
 - + Know how to produce, good income, good knowledge, good health

- + Their children only finished secondary school.
- + Most of them get other income out of agriculture as boss sewing.

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 or wind. Light rain appears from February to April, at the time the temperature is cold. Hot, Sun and heavy rain with storm from May to August. Cool in September and October, light rain and cold some time dry in December and January. Nor are the differences in the social events mentioned events mentioned especially significant; it may be noted that there are important days in almost every month, some of them traditional, others promoted by the state.

In relation to economic activities, the calendar for all groups shows double-crop rice cultivation being practised by all groups. Winter – spring rice is planted in February and harvested in May; summer-autumn rice follows immediately from July/August, with harvest in October and November. All groups are also engaged in field crop cultivation, maize, beans, are planted after rice harvesting in winter, at the moment this activity is not active due to they can find sub job as made dressing and leather shoe can earn more money. For men groups didn't mention field crop.

Most groups were also engaged in livestock cultivation, for rich groups have more animals than poor group. Fishing is mentioned in poor groups and rich men group, suggesting the relatively between poor people, men and wild fish. Fish culture was mentioned in women and rich men groups. Sewing was mentioned in most groups in second haft year. Rich men group mentioned trading.

From this analysis, there are clear peaks in the labor demands and income flow from agriculture and sewing. Families are extremely busy in February for transplant rice, May, June for rice harvesting and transplanting and from September to January for rice harvesting and sewing season. While the main income streams appear particularly concentrated in that time. Health problems is mentioned from most groups in early summer and the end of year specifically flu, cough in children at the change of seasons and tiredness. Wage labour appears in all groups as sewing, leather shoe and handicraft.

3.2 Group Activity Profile

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

Poor Women

Names Activities	Nguyen Thi Hue	Duong Thi Kim	Sinh Thi Hoa	Nguyen Thi Le	Total
Rice cultivation	3	7	7	6	23
Field crop		2			2
Fishing	2	4	7		13
Fish culture				4	4
Dress marking			3	7	10
Handicraft	7	4			11
Leather shoe	6				6
T. care children	2	3	3	3	11
Total	20	20	20	20	80

Poor Men

Names Activities	Nguyen Van Hoa	Nguyen Sinh Tu	Pham Van Hoang	Nguyen Van Hong	Nguyen Van Nguyen	Total
Rice cultivation	6	4	5	4	4	23
Livestock	3	4		3	4	14
Fishing	7		3	5	2	17
Dress making		4	5	5	4	18
Wage labour		4	3		3	10
T. care children	4	4	4	3	3	18
Total	20	20	20	20	20	100

Rich Women

Names Activities	Nguyen Thi Luu	Ngo Thi Tuoi	Nguyen Thi Oanh	Nguyen Thi Toan	Duong Thi Loan	Total
Rice cultivation	4	4	5	5	5	23
Field crop		1		1	1	3
Livestock	6	4	3	3	4	20
Wage labour	5	4	6	4	5	24
T. care children	5	3	6	4	5	23
Fish culture		4		3		7
Total	20	20	20	20	20	100

Rich Men

Names Activities	Nguyen Van Khuong	Nguyen Van Lap	Nguyen Van Tat	Dang Van Quan	Duong Van Quyem	Tota l
Rice cultivation	6	6	4	5	4	25
Livestock	5	6	4	4	5	24
Dress making	3	2	5	3		13
Fishing	2	2	5		3	12
Handicraft	2					2
Fish culture					6	6
Leather shoe		2				2
T. care children		2	2	2	2	8
Trading	2			6		8
Total	20	20	20	20	20	100

These are summarised in Table 3.1. It will be noted that all poor and rich men households rank rice cultivation high on the list, it mean rice cultivation is an important activity for low land area. Sub work and fishing brought high income for all people, so that for rich women put wage labour activity on highly and poor men mentioned high income from fishing in rainy season. More water surface area for fish culture in this area than other places so that fish culture also mentioned by women and rich men groups.

Table 3.1. Activities summary:

Poor Women	Poor Men	Rich Women	Poor Men
1. Rice cultivation	1. Rice cultivation	1. Wage labor	1. Rice cultivation
2. Fishing	2. Take care children	(Handicrafts, Dress	2. Livestock
3. Livestock	3. Dress making	making, T. rice)	3. Dress making
4. T. care children	4. Fishing	2. Rice cultivation	4. Fishing
5. Handicrafts	5. Livestock	3. Take care children	5*Take care children
6. Dress making	6. Wage labor	4. Livestock	6* Trading
7. Leather Shoe		5. Fish culture	7. Fish culture
8. Fish culture		6. Filed crop	8** Handicrafts
9. Field crop			9** Leather Shoe

*, ** is the same level

Several other points are worth noting. These include:

- Rice cultivation is the most important in low land area.
- Fishing and fish culture activities appears in most groups.
- Sub-work and fishing brought high income for most people.
- At the moment field crop activity is less important with all groups.

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

Criteria Species	Few bone s	Delicio us	Easy catc h	Chea p	Easy cultu re	High value	Grow fast	Tota l
<i>Carisius auratus</i>			5	2		2		9
Big FW clam	3	2	3	1	3	2	1	15
Grass carp	1	3	2		3	3	2	14
Common carp	1	4	3		3	4	3	18
Indian carp	1	2	2		3	2	2	12
<i>Sq. curriculus</i>	1	2	2		3	3	1	12
Silver carp	1	1	3	1	3	2	2	13
Clarias catfish	4	3	1		3	2		13
River catfish	3	3	1			1		8
<i>Anabas tes.</i>	1	1	2	1		1		6
Snake head	3	3	2			3		11
Shrimp	3	4	5		3			15
Crab		2	3	1		2		8
<i>Mis. fossilis</i>	4	3	1			1		9
<i>O. pagalense</i>	4	3	1			1		9
Snail	3	2	5		3	2		15
Frog	2	3	1			1		7
Water snake	3	1	1			1		6
Total	38	42	43	6	27	33	11	200

Figure 4.2: Poor Men

Criteria Species	Available	Delicio us	Easy catch	High price	Easy sell	Tota l
Common carp	5	6	3	4	4	22
<i>Anabas tes.</i>	6	3	2	2	2	15
Snail	4	2	4	1	2	13
Crab	6	1	6	2	2	17

Snake head	2	6	2	6	2	18
River catfish	1	4	2	1	1	9
Clarias catfish	2	3	2	2	2	11
Grass carp	1	3	2	3	2	11
Silver carp	1	1	2	2	3	9
Indian carp	1	1	1	2	2	7
<i>Squ. curriculus</i>	1	4	1	2	1	9
<i>He. leucisculus</i>	5	1	4	1	2	13
<i>Carissius auratus</i>	7	1	1	1	2	12
Big FW clam	4	1	3	1	2	11
Shrimp	6	3	6	4	4	23
Total	52	40	41	34	33	200

Group 3: Rich Women

Criteria Species	Cheap	Available	Easy catch	Delicious	Expensive	Few bones	High nutrient	Total
<i>Squ. curriculus</i>				3	3		3	9
Grass carp		3			6			9
<i>Anabas tes.</i>	2	3		5			5	15
Common carp		5		5	5		7	22
Snake head				5	4		5	14
Indian carp		4			3	2		9
<i>Pse. fulvibraco</i>				3		4		7
<i>Mis. fossilis</i>				5		5	4	14
Frog				4	3		3	10
Crab	2	3		4			5	14
<i>Rasborinus sp.</i>	1			1				2
Shrimp	1	2		1			1	5
Clarias catfish					1		1	2
Snail	1	4		6			5	16
Small wild	1	1					1	3

fish								
Silver carp	1	2					4	7
Clams	1	1		1				3
<i>He. leucisculus</i>	1	1		1				3
<i>Cra. sinensis</i>	1	1		1				3
Tilapia		3						3
<i>Carissius auratus</i>	1	1						2
River catfish	1	1		1		1	1	5
<i>Elo. bambusa</i>				3				3
<i>O. pagalense</i>					3	2		5
<i>Cynoglossus sp.</i>		1		3			2	6
Water snake					3			3
<i>Glo. giuris</i>		3		3				6
Total	14	39	0	55	31	14	47	200

Group 4: Rich Men

Criteria Species	Available easy catch	High price	few bones	Delicious	Easy sell	Grow fast	Total
Silver carp	3			1	3	4	11
Snail	4	2	2	2	4		14
River catfish	3	3	3	3	4		16
Indian carp	3	2		1	2	1	9
Water snake	3	4	2	3	4		16
Eel	3	4	3	3	4		17
Grass carp	3	2		2	2	2	11
Snake head	2	4	3	4	4		17
Shrimp	2	4	4	3	5		18
Crab	3	3	2	3	3	2	16
<i>Macrura reevesii</i>	2	3	2	3	2		12
Common carp	4	4	2	4	3	3	20
Tilapia	1	2	1	2	2		8
<i>He. leucisculus</i>	2				2		4
Clams	3		4	2	2		11
Total	41	37	28	36	46	12	200

It will immediately be apparent that all groups mentioned wild fish due to Tasty, expensive and available. Common carp is a species the most important with all groups. Shrimp and snake head were mentioned by most groups. Rich group liked *Mis. fossilis*.

Important Aquatic Animals - Summary:

Poor Women 18 Species	Poor Men 15 Species	Rich Women 30 Species	Rich Men 16 Species
1. Common carp	1. Shrimp	1. Common carp	1. Common carp
2. Shrimp	2. Common carp	2. Snail	2. Shrimp
3. Snail	3. Snake head	3. <i>Anabas tes.</i>	3. Snake head
4. Big FW clam	4. Crab	4. Crab	4. <i>Misgurnus fossilis</i>
5. Grass carp	5. <i>Anabas tes.</i> (poor)	5. <i>Misgurnus fossilis</i>	5. River catfish
6. Clarias catfish	6. <i>Hermilculter leucisculus</i> (poor)	6. Snake head	6. Water snake (Expensive)

Important Criteria - Summary

Reasons	Criteria	Poor		Rich	
		Women	Men	Women	Men
Consume	Delicious	42	40	55	36
	Cheap	6		14	
	Few bones	38		14	28
	Easy catch	43	41		
	Available		52	39	41
	High nutrition			47	
Culture	Expensive	33	34	31	37
	Grow fast	11			12
	Easy sell		33		46
	Easy culture	27			

The criteria as expensive, delicious, available and few bones were most people in the village liked. Criteria for fish culture as grow fast, easy culture were also mentioned in here.

5. Aquatic Animal Seasonality and Trends

From figure 5.1-5.4 shown that for all groups like wild fish due to available, few bones & tasty. All groups have wild fish due to catch in Nhue river and in field in rainy season when fish were spawning. This point leads to reducing natural resource. The buying fish in

market is not mentioned this area. General, this area have a lot wild aquatic animal due to low land.

6. Aquatic Animal Trends

Poor Old Women

Periods Species	Befor e 60	60 - 65	65- 70	70- 75	75- 80	80- 85	85- 90	90- 95	95- 2000
Common carp	Increasing A lot of fish, few people, no pollute env., no pesticide			Stable. Increasing people, many people catch, fish grow slow			Decreasing: Pollute en., pesticide, electric shock, modal equip.		
Shrimp	Increasing						Decreasing: Industrial waste water make reduce resource		
Snail	All periods similar shrimp								
Big FW clam	All periods similar shrimp								
Grass carp	All periods similar Common carp								
Clarias catfish	All periods similar Common carp								

Poor Men

Periods Species	Befor e 1960	60- 65	65 - 70	70- 75	75-80	80- 85	85- 90	90- 95	95-2000

Shrimp	Increasing: Good env., few people catch	Stable: Reducing quantity not much due to many people catch	Decreasing Pollute env., many people catch
Common carp	All periods similar shrimp		
Snake head	All periods similar shrimp		
Crab	Increasing Good env., few people catch		Decreasing Pollute env., many people catch
<i>Anabastes.</i>	All periods similar crab		
<i>Hemiculter leucisculus</i>	All periods similar crab		

Rich Women

Periods Species	Before 1970	70-75	75-80	80-85	85-90	90-95	95-2000
Common carp		Stable: Good env., few people catch			Decreasing: Pollute env., too exploited, using electric shock		
Snail		Stable			Decreasing		
<i>Anabastes.</i>		Stable			Reducing a little		
Crab		Stable			Reducing		
<i>Misgurnus fossilis</i>		Stable			Quick reducing		
Snake head		Stable			Quick reducing		

Rich Men

Periods Species	Before 1960	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-2000
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Common carp	Stable No pollute from Nhue river, catch few		Decreasing: Pollute from Nhue river, high population, using pesticide
Shrimp	Stable No pollute	Stable Event Pollute, but increasing & decreasing a little due to spawning a lot	
Snake head	Stable		Decreasing: Fast reducing due to high price, a lot people fond it
O. <i>pagalense</i>	Similar snake head		
Clarias catfish	Similar shrimp		
Water snake	Normal, no body concern, from 85-95 reducing a little		Fast reducing due to using electric shock, export to China

All groups in the village like wild fish, but recently most of wild fish were decreasing due to chemicals, pesticides used in agriculture, damaged equipment as electric shock. Only fish culture are increasing due to developing seed & technique. Most people like common carp, shrimp and snake head. Common carp, snake head and shrimp at moment are decreasing. But for rich men group mentioned shrimp has not decreasing due to spawning a lot.

7. Cross checking

7.1 Transect Walk

Head of village taken us to around the village with the map and shown low fields, ponds, pump station, people living, which river, canals have wild fish & where water resource run to and where they could catch wild fish.

7.2 Farmer meeting

- Shown the map of their village which some people had drawn yesterday evening 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:

- Rice cultivation is the most important activity for all people in the Trai village due to they have large low land area. Most groups mentioned fishing and wage labour brought high income for their families. At the moment field crop activity is not important and only mentioned by women groups and put it in the end of list activities.

- Most people in the village mentioned common carp, shrimp and snake head and women groups mentioned snail, while rich groups mentioned *Mis. fossilis*.

- Livelihoods of many people in the village are still base on fishing and it is main work for them.

- Most wild fish are decreasing due pesticide, chemicals used in agriculture and human exploited too much both small size and spawning season with damaged equipment as electric shock.

8. Summary/ Key Points

- Most of groups have same ideas about weather as temperature, rain, sun, wind and storm, about social events as Tet, children new year. etc.
- There are high number of children stop school early at grade 3-4 (not finish primary school)
- Most groups have two rice crops: Transplant in month 1 and 6 and harvesting in month 4-5 and month 8-9. For most people in the village, the rice cultivation is an important in this area. Fishing and wage labour brought high income.
- Most people like wild fish due to tasty and available. The criteria about aquatic animals are available, easy catch, tasty, few bones & expensive.
- Most wild fish are decreasing. There are a lot wild fish is in this area.