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

Case Study V4:
Cham Ha Village, Quang Lang Commune, Phu Xuyen District

1. Introduction

1.1 Schedules and Persons Involved

This study was carried out between June 2 and June 18-19, 2001. The RIA-AIT team first visited the commune on June 2 and worked on the PRA process on June 18-19. After collating and translating information obtained at RIA1 in evening June 18, the team has a 'debriefing' with villagers in late afternoon of June 19. 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 km^2 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 communes often get drought. It was decided to select three communes along a transect from east to west, Quang Lang in the drought 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 summary 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, Van Tu and other communes in the district. An introduction to Mr. Vu Van Manh, Chairman of Quang Lang commune, Phu Xuyen district for the morning of June 2, details of the constituent villages of the commune were obtained. The commune comprised 8 villages. Cham Ha village is poorest village, they used to harvest wild fish larvae from river, no trading and the end of district near with Ha Nam province. An appointment with Mr. Manh in morning of June 18, he in turn facilitated an introduction to Mr Le Duy Khien, party labour Commune Office in Quang Lang Commune and Mr. Le Van Thuan, head of Cham Ha village.

It was stated that Cham Ha village contained 136 households with the greatest number of poor households, especially old women-headed households live alone, the size of the village was a suitablet for PRA. One of these, Cham Ha, was then randomly chosen.

The team immediately secured an appointment with village leaders in Cham Ha including

1. Mr. Le Duy Khien (Labor party office in the village)
2. Mr. Le Van Thuan (Head of village)

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. Do Van Chon and Mr. Le Van Huong, in the head of village's house the meeting was taking place. Cham Ha village sits on a ridge of Red river dyke surrounded concentrically by fields and paddy land. The paddy land to the North and Northeast of the village appears to be rather more high-lying and includes the one church, a well in front of church, Temple and old market. The main area of aquaculture ponds also appear 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 Le Van Huong and La Van Thao, 70 and 71-year old men. They stressed political events. Cham Ha church was built in 1890. Most of people in the village follow god. In the following thirty years the village was badly affected by conflict. In 1941, there was a starving most people had to work for French in rubber farm. By 1947, French army came to the village and established a station to protect village in 1950. By 1954, French army left. A revolution was carried requiring reduce land tax in 1956 and a mutual help co-operative was established in 1957. In 1960, a agricultural co-operative was established and it changed in to Quyet Tien co-operative in 1965. At the time the fighting with the American army was broken, most young people jointed army and two mid roads of village were built in 1968. Electric was installed in 1980, after that some years standard living was improved and many brick houses were constructed and village road was repaired in 1995

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

Well-Being Ranking Criteria

Rank	Trial1 Le Van Thuan Head of Village	Trial 2 Do Anh Chon Farmer	Trial 3 Nguyen Thi Dieu Village Women Union
Poor 1	A little land, too poor due to big debt couldn't payment so that co-operative kept their land. Their children stop study in grade 3-4 Small & bad house, No TV & radio. Lack of food 5 months/year had to borrow to eat. Low product. Most old people Tax Debt year by year	Too old, very poor economic Lack of food for 3 month/year. Land the same every body Lack of farm equipment & information facilities.	Kept land send to other people to go Southern to earn money A lone, some person have die Most households were old & weak. Lack of food for 4-5 months / year. Lack of farm equipment & information facilities as TV, radio. Some people have big debt couldn't pay so that land was kept Their children stop go to school early.
2	Lack of food 3-4 months / year. No TV, Radio, simple & cheap farm equipment. Their children finish primary school or broken secondary school. Land tax payment for 30-40%	Enough rice	Lack of food for 1-2 months/ year. Cheap farm equipment Children stop to school early. Wage labour
3	Lack of food 1-2 months/year. Land tax payment for 60-70%. Lack of money. Children stop at secondary school. Normal farm equipment No TV & radio. Wage labour.	Wage labour. Have farm equipment. Had normal house.	Enough food Enough conditions in order children to school. Normal farm equipment.

4	Some houses have flat roof black & white TV or second hand, rice machine Children stop secondary school, some couldn't finish primary school. Enough food & can land tax payment	Some houses have flat roof. Spare some food & money Have colour TV & motor bye Good farm equipment. Some households are commune staff	Spare some food, have motor bye & expensive farm equipment
5	Enough food, money, some households have motor bye, colour TV & good farm equipment. Some children go to high education Good knowledge Land tax payment in time.		

- Social Structure of the Community: Community includes 8 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

- Cham Ha village sits on a ridge dyke of Red river surrounded concentrically by high fields and paddy land.
- The church of village has been established for 110 years & developing. Most people follow god.
- Well-being ranking criteria:
- Poor Households:
        + Often old people live a lone, Simple house.
        + Lack of: food about 3-5 months/year, facilities, furniture, farm equipment & investment. Most people have tax debt.
        + Their children did not finish primary school.
- Fairly Poor:
        + Have a house & simple and cheap materials but still lack investment.
        + Lack food 1-3 months/year
        + Wage labour.
        + Children stop to school yearly
        + They could pay land tax for 30-40%
- Medium:
        + Enough food, but still not enough money. Have normal farm equipment and normal houses, wage labour.

+ Their children often stop at secondary school.

+ They could pay land tax for 60-70%

- Fairly Rich:

+ Know how to produce, spare some food & enough money, finish basic building, enough facilities, furniture.

+ They could pay land tax for 100%. Their children often finish secondary school.

- Rich Households:

+ Good knowledge, their children can go to high education.

+ Enough materials, good houses, even motorbikes, spare food and some money. they can pay land tax in time.

+ 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 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 festivals and ceremonies in almost every month, some of them traditional, others promoted by the state. Especial the Noel is mentioned in all groups.

In relation to economic activities, the calendar for all groups shows 2/3 agriculture land area in spring for field crop and 1/3 of it for rice cultivation and in Autumn is opposite. A 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 September/October. All groups are also engaged in field crop cultivation, again over two seasons. Maize, beans, peanuts are also planted in February and harvested in May-June. For poor men group, a second crop of soil bean is planted in June and harvest in October; for men group, a maize crop is planted in June and harvested in October, the winter crop is after harvesting second rice crop. The economic activities with poor old women are very simple.

All groups were also engaged in livestock cultivation, for rich groups have more animals than poor group. This was shown in harvest and stock. Fish culture is mentioned in rich men, suggesting the relatively lesser importance of fish culture for the poor.

From this analysis, there are clear peaks in the labour demands and income flow from agriculture. Families are extremely busy in May, July and October-November, 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, measles in children, joint disease in old people at the change of seasons and tiredness. Wage labour often appears in free time and dry season at the time for construction.

3.2 Group Activity Profile

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

Poor Women

Names \ Activities	Le Thi Nha	Trieu Thi Nhu	Le Thi Vi	Le Thi Se	Le Thi Minh	Total
Chicken rearing	3		2		2	**7**
Bananas & longan tree			7	5	3	**15**
Helping children	5		4		3	**12**
Rice land rent	5	10	4		5	**24**
Taken care by children	7	10	3	6	7	**33**
Small trading				9		**9**
Total	**20**	**20**	**20**	**20**	**20**	**100**

Poor Men

Names \ Activities	Le Van Huong	Le Van Ngan	Le Van Thich	Le Van Ky	Dao Van Chuong	Total
Rice cultivation	6	10	5		3	**24**
Field Crop	7	6	6	10	8	**37**
Livestock	4		5	8	4	**21**
Gardening	3	4	4	2	5	**18**
Total	**20**	**20**	**20**	**20**	**20**	**100**

Rich Women

Names / Activities	Nguyen Thi Tinh	Nguyen Thi Oanh	Nguyen Thi Tron	Do Thi Mac	Nguyen Thi Dieu	Total
Rice cultivation	7	8	8	9	8	40
Field Crop	8	7	7	6	7	35
Livestock	5	5	5	5	5	25
Total	20	20	20	20	20	100

Rich Men

Names / Activities	Dang Van Thiep	Do Xuan Bo	Le Duy Khien	Le Van Hai	Le Van Hung	Total
Rice cultivation	2	4	2	3	3	14
Field Crop	2	3	3	4	3	15
Livestock	4	4	4	6	4	22
Trading	5	4	3		5	17
Fish culture			3			3
Take care children	7	5	5	7	5	29
Total	20	20	20	20	20	100

These are summarised in Table 3.1. It will be noted that better-off men households rank take care children and livestock high on the list, but the better-off women rank rice cultivation, field crop cultivation highly. All groups haven't place importance on wage labour. For old poor women group is taken by children. Most of groups mentioned income from field crop is higher than from rice cultivation because the land in this area is very high and often drought.

Table 3.1. Activities summary:

Poor Women	Poor Men	Rich Women	Rich Men
1. Taken care by children	1. Field Crop	1. Rice Cultivation	1. Take care children
2. Benefit from land rent	2. Rice Cultivation	2. Field Crop	2. Livestock
3. Gardening	3. Livestock	3. Livestock	3. Trading
4. Helping children	4. Gardening		4. Field crop
5. Small trading			5. Rice Cultivation
6. Chicken rearing			6. Fish Culture

Several other points are worth noting. These include:

- For poor men groups: Their main purpose is earn money because poor household men, they are main labour. So forget take care children and rich women group is also. Contrary rich men mentioned this activity on the top of list, follow them this activity is very important for other activities. For poor women, all of them are too old and weak and live alone so they are taken care by children and government.

- Even the land for every person in Cham Ha village is the same area but there are difference between poor & rich group. For some too poor women too old so that can not work and some people couldn't pay enough land tax so that some land species are kept.

- 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 quantity. Because for poor people lack investment.

- The overall low ranking of fish culture and this activity only appears in rich men group.

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	Easy buy	Available	Given by children	Few bones	Cheap	Total
Silver carp	10	10	14		10	44
Indian carp	8	6	10		4	28
Carassius auratus	6	4	6		8	24
Grass carp			8	4		12
Shrimp	6	2	4	6		18
Clarias catfish	2	2	2	4		10
Tilapia	4	4	2	4	4	18
Anabas testudineus	6	6	2		6	20
Snake head			2	4	6	12
Crab	4	2	4		4	14
Total	**46**	**38**	**56**	**24**	**36**	**200**

Figure 4.2: Poor Men

Criteria / Species	Easy Buy	Easy Catch	Expensive	Cheap	Delicious	Total
Shrimp	1	4	1	3	4	13

Species						Total
Common carp	2	1	2	1	6	**12**
Indian carp	5	4	2	4	3	**18**
Clarias catfish	2	2	2		6	**12**
Silver carp	5	5	2	6	3	**21**
Anabas testudineus	5	5		5	2	**17**
Carassius auratus	5	4	2	5	3	**19**
Grass carp	2	3	3	2	5	**15**
FW Clams	1	2	2		3	**8**
Snail	2	3	2		3	**10**
Snake head	2	1	3		3	**9**
Small wild fỸh	3	3		4	2	**12**
Tilapia	1	2		2	2	**7**
O. *pagalense*	1		2		3	**6**
Mis. anguillicaudatus	1		2		3	**6**
Crab	1	2	2		3	**8**
Frog	2		2		3	**7**
Total	**41**	**41**	**29**	**32**	**57**	**200**

Figure 4.3: Rich Women

Criteria \ Species	Delicious	Cheap	Available	Easy culture	Total
Shrimp	7		6		**13**
Silver carp	7	6	5	6	**24**
Carassius auratus	5	7	7		**19**
Small wild fỸh	5	8	9		**22**
Crab	7	6	7		**20**
Snail	4	5	12		**21**
Grass carp	8		9	4	**21**
Common carp	7		5	5	**17**
Big FW clam	6	6	5	4	**21**
Small FW clam	7	6	9		**22**
Total	**63**	**44**	**74**	**19**	**200**

Figure 4.4: Rich Men

Criteria / Species	High Value	Delicious	Few bones	Grow fast	Easy culture	Easy catch	Total
Silver carp	3			2	2	1	8
Grass carp	5	2	2	3	2	1	15
Indian carp	4	2		3	2	1	12
Common carp	5	2	2	3	2	1	12
Spinibarbus coldwelli	1	1		1			6
Snake head	3	2	2	3	3	1	14
Snail	2	3	3		4	6	18
Big FW Clam	2	1	4			4	11
Small FW Clam	2		2			5	7
Clarias catfish	6	4	6		3		19
Anabas testudineus	3	3		2		5	13
Shrimp	5	3	3			4	15
Crab	2	2				5	9
Eel	3	2	4				11
Mis. anguillicaudatus				7			7
Frog	4	4	4				12
Carassius auratus	1			2	2	1	6
Small wild fish	1					4	5
Total	**52**	**31**	**32**	**26**	**20**	**39**	**200**

It will immediately be apparent that the ranking is rather different between the different groups. The better-off men emphasised some cultured species and high value, delicious species. For poor groups mentioned cheap and available culture species and cheap wild fish species as silver, Indian carps, *Anabas testudineus* and *Carissius auratus*. For rich women also mentioned cheap wild fish species as small wild fish, snail, FW clams and cheap and available culture fish as silver and grass carp. Poor groups and rich women liked silver carp, even it has a lot of bones, no tasty, but it is very cheap and available. Most groups mentioned shrimp and grass carp.

Important Aquatic Animals - Summary:

Poor Women 10 Species	Poor Men 17 Species	Rich Women 10 Species	Rich Men 19 Species
1. Silver carp 2. Indian carp 3. *Carissius auratus* 4. *Anabas testudineus* 5. Shrimp 6. Tilapia 7. Crab	1. Silver carp 2. *Carissius auratus* 3. Indian carp 4. *Anabas testudineus* 5. Grass carp 6. Shrimp	1. Silver carp 2. Small Wild Fish* 3. Small FW Clam* 4. Snail** 5. Grass carp** 6. Big FW Clam**	1. Catfish 2. Snail 3. Grass carp 4. Shrimp 5. Snake head 6. Common carp

Important Criteria - Summary

Reasons	Criteria	Poor		Rich	
		Women	Men	Women	Men
Consume	Easy buy	46	41		
	Available	38		74	39
	Easy catch		41		
	Expensive		29		
	Cheap	36	32	44	
	Few bones	24			32
	Delicious		57	63	31
	Given by Children	56			
Culture	Grow fast				26
	High value				52
	Easy culture			19	20

5. Aquatic Animal Seasonality and Trends

From figure 5.1-5.4 shown that for poor groups and rich women like wild fish due to cheap, available, easy buy, few bones & tasty, rich men like fish culture with criteria as grow fast, high value and easy culture. Poor men have wild fish due to catch few in canal in rainy season when fish were spawning. This point leads to more reduce natural resource. For poor women have them due to get from children buy in market. For rich women get wild fish due to buy also and catch by children in canal as small FW clam. For fish culture come mainly by harvesting or buy in market. Most people in Cham Ha like fish culture in winter and spring season when cold weather and more harvesting time. General, this area is very few wild aquatic animal due to drought fields. At the moment, the people can not harvest larvae and fry in red river due to reducing rapidly natural resource.

6. Aquatic Animal Trends

Poor Old Women

Periods / Species	Before 1960	60-70	70-80	80-90	90-95	95-2000	After 2000
Silver carp	Few, Lack of seed	Stable	Stable	In. Develop culture			Don't know
Indian carp	Similar Silver carp						
Carissius auratus	In. Good env., few people catch			Pesticide, duck. lime, drought			less time to field
Anabas testudinius	Similar *Carissius auratus*						
Shrimp	Similar *Carissius auratus*						
Tilapia	Didn't remember		In. Develop culture				Don't know
Crab	*Similar Carissius auratus*						

Poor Men

Periods / Species	Before 1960	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-00
Silver carp	Few War, no artificial breeding	In. Stock, exploited a little	In. Env. recruiting	Dec. American war, bomb	In. Gov. helped investment, seed & technique				
Carissius auratus	In. A lot wild water area, no development canal, no exploited		Dec. There were canal systems & dykes	Dec. Re American war, bomb proud	Dec. Exploited a lot, increasing population, reduce wild water area, bad env. using pesticide, damage exploited equipment.				
Indian carp	In.			Dec.	In.				
Anabas testudinius	In.		Dec.						
Grass carp	In.			Dec.	In.				
Shrimp	In.		Dec.						

Rich Women

Periods / Species	Before 1960	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-00
Silver carp	Stable due to hadn't exploited wild fish			Dec. American war	In. Env. recruiting	Dec. Too exploited, reduced wild water area	In. Gov. helped investment, seed, developed technique		
Small wild fish	Stable Hadn't exploited wild fish			Dec. American war	Dec. Increased population, too exploited by damaged equipment, pollute env. using pesticide in agriculture, reducing wild water area				
Small FW clam	Stable			Dec.					
Snail	Stable			Dec.					
Grass carp	Stable			In.					
Big FW clam	Stable			Dec.					

Rich Men

Periods / Species	Before 1960	60-70	70-80	80-90	90-00	After 2000
Catfish	In Good env., few people, need few		Dec. Increasing population, need more, env. effected by chemical, pesticide			Dec. Using damaged equi.
Snail	Dec. In. rearing, pesticide		As above		A lot duck	
Grass carp	In. As above		Dec. Pollute env.			
Shrimp	In.		Dec. As above			
Snake head	In.		Dec. As above			
Common carp	In.		Dec As above		In. Culture a lot.	

Three of four groups in the village like wild fish, but recently most of wild fish have been decreasing due to chemicals, pesticides used in agriculture & damaged equipment as electric shock. Only fish culture are increasing due to develop seed & technique. But in rich men group comment that at the moment grass carp is decreasing due to pollute environment and disease. For poor women shown most aquatic animal were reducing in period from 1970-1975 and rich men group is also. Most people like shrimp, silver carp, grass carp. For common carp is reducing in nature but increasing in culture, for shrimp is decreasing. For poor groups like silver, Indian carp, *Carissius auratus, Anabas testudinius* and shrimp.

7. Cross checking

7.1 Transect Walk

Head of village and some men taken us to around the village with the map and shown church, well, dyke, where their fields, ponds, people living, which 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 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:
- For poor women are too old to do anything with economic activities. This area, field crop brought the most important income due to high land. The economic activities are very simple.
- For rich women forget activity: take care children and they thing it is not important and it is put after livestock, but the big difference with rich men group, the take care children is very important and put on the top list of activities. Follow rich men if good take care children will have every thing, take care children is activity all days, all years, but agriculture activities are only season. For this activity in poor men group thing that the children have to take care them.
- For aquatic animal: most people liked silver carp, Indian carp and wild fish due to cheap, available. For old poor women have not bough and caught fish. They have fish due to children gave them.
- Most wild fish are decreasing due to drought, 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
There are high number of children stop school early at grade 3-4 (not finish primary school
- Most of groups have same ideas about weather as temperature, rain, sun, wind and storm, about social events as open church, church festival, Noel day and Tet.
- Most groups have two rice crops: Transplant in month 1 and 6 and harvesting in month 4-5 and month 8-9. But the rice cultivation is not important with this area. The most important is field crop.

- The most important for old poor women is looked after from children and government because they are too old to do anything economic activities.
- Most poor people and rich women like wild fish, cheap and available culture fish. Rich men like culture fish and tasty wild fish. The criteria about aquatic animals are cheap, available, easy culture, easy buy, tasty, few bones & high nutrient.
- Most wild fish are decreasing and some culture fish are increasing.