

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

Case Study V9

Vinh Tuy Village, Lien Nghia Commune, Van Giang District

1. Introduction

1.1 Schedules and Persons Involved

This study was carried out between May 31, July 3 and 4, 2001. The RIA1-AIT team first visited the village on May 31 and worked on the PRA process on July 3 and 4. After collating and translating information obtained at Vinh Tuy village on July 4, the team had a 'debriefing' with villagers on July 4. 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 km² 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 ²)	4.83	5.27
Land Area (ha)	No data	500
Agricultural Area (ha)	197	319
Agriculture Households (%)	98	100
Population Density (person/km ²)	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>Anabas tes</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, Lien Nghia and other communes. An introduction to Mr. Nguyen Van Thang, chairman of Lien Nghia People's Committee, details of the constituent villages of the commune were obtained. Lien Nghia Commune comprised 6 villages as follows:

- | | |
|------------------|--------------|
| 1. Da Kim | 400 families |
| 2. Phi Liet | 600 families |
| 3. Vinh Tuy | 200 families |
| 4. AB Quan Trach | 350 families |
| 5. CD Quan Trach | 400 families |
| 6. Ba Khe | 200 families |
| 7. Xam Trong | 195 families |
| 8. Xam Hong | 200 families |
| 9. Tam Tang | 140 families |

Most villages have not rice cultivation, except Vinh Tuy village has small area for rice cultivation. Some villages sit near the dike of Red river, but Vinh Tuy village sits in the

field. Most villages are fairly rich, Vinh Tuy and Ba Khe are a little poorer. The size of the villages was suitable for PRA. One of these, Vinh Tuy was chosen.

The team immediately secured an appointment with Mr. Chu Van Hao, head of village. On the basis of which an appointment was made to begin work that same afternoon. Agriculture land area of the village is 28.8 ha and water surface area is 3.6 ha. Main water areas are public ponds, few own ponds. The village has no starving households and only 7% poor households (new criteria), 5 poor HH (old criteria).

2. Setting the Context

2.1 Mapping the Current Resource Context

Figure 2.1 presents the village resource map. This was drawn by Mr. Chu Van Hao, head of village, in Mr. Hao house where the meeting was taking place. Vinh Tuy village sits field and surrounded concentrically by fruit trees, field crops and small rice field area. The roads, canals, houses and communal house are shown. 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. Chu Van Khoi, 76 year old and Mr. Le Van Hieu, 68 year old. They stressed political events. The village was established for 120 year ago. At this time there was an area of 65 mau 5 sao (23,6 ha) and called 'belt band land'. By 1946 protective group was established. Japanese came the village in 1948-1949, at this time french came back the village. A revolution was established in 1951, 1952. At this time most young people had to enjoin army to against French. A new authority was established in 1953 to divide land for every people. A revolution required reducing land tax formed in 1954, 1955 and a new agricultural co-operative was established in 1956. At this time there were 19 households. The cultural house was built in 1961. By 1967 two co-operatives: Vinh Tuy and Dan Kim combined into Vinh Kim co-operative, by 1993 the cultural house was rebuilt and kindergarten and pavilion were built at that time. The cement village road was constructed in 1994. Mother temple was built in 1996.

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

Well Being Ranking Criteria

Rank	Trial 1	Trial 2	Trial 3
		Chu Van Hao Head of Village	Ly Thi Trien Birth control
1	Poor economic HH because no change land using have risks, no ability payment, old and small house, their children don't go to school, no TV and some furniture are very bad, agriculture tax is difficult to be paid	Poor economic families, lack of investment, have some risks, their houses are not so good, their children are too young and have problem in studying.	Economy is bad, their houses are not so good, no materials. Lack money for investment, have to borrow money to invest
2	Generally, this group is better than group 1, but had not paid taxes about 30%, their house is not so good, and furniture is not good. They also changed land using but not successful so much	Their economy is still poor, have houses , some one have TV	Almost have houses, unlucky in work, know how to borrow to invest for working

3	Land tax payment enough, stable income, some ones have good houses, almost children finished secondary and know how to work	Stable income, no a loan for production, their children have conditions to school. Knowing change land using in agriculture according to market, some ones have good houses, almost have TV, one family has motor bike	Stable economy families, some of them also borrow money to invest, 2 /3 people have good houses. They also have TV
4	Spare some money, enough furniture in houses. Their houses are good, 80%HHs have motor bike, good conditions for children to school, some business households have good knowledge.	Having motor bike, TV, telephone. Know how to work well! Some business households, contacting pond, tree nursing, big houses. Their children have good conditions for studying	Economic is good, have motor bike, big houses, attend to business, trade.

(Each person has 360 m², land changing from rice cultivation to kumquat, organ, and apple)

- 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

- Vinh Tuy village sits in field surrounded concentrically by delta with field crop and fruit tree.
- Wealth Ranking criteria:
 - Poor Households:
 - + Poor economic, no changing land using or changing late from rice cultivation into fruit tree and ornament tree, get risks, simple house and know how to borrow money to invest.

- + Lack money for investment, lack facilities, furniture & farm equipment.
- + Their children often stop learning early.
- + Couldn't pay agriculture tax for more 30%.
- Medium:
 - + Pay enough land tax, stable income, some HH have good houses, know how to work, how to using land get high income. Some people have a loan for investment.
 - + Their children often finish secondary school.
- Rich:
 - + Good economic spare some money.
 - + Know how to produce, changed land using early, 80% HH have motorbike, all of them have good houses, good furniture.
 - + Good conditions for children studying.

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 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 two rice cultivation crops being practised. Transplant rice in February and July and harvest in June and October. All groups are engaged in field crop cultivation. Maize, beans and peanuts are planted in February-March and harvested in May-June; one tomato crop is planted after harvesting bean, maize and vegetable are planted in September, October and harvested in December, January. Fruit plants as orange and kumquat are planted in February, March and harvested in November, December and January. For ornament kumquat is changed in June-July and also harvested in New Year. Medicine tree is planted in February and harvested in December- January.

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 labour demands and income flow from agriculture. Families are extremely busy in May-June and November, December-January, while the main income streams appear particularly concentrated in May-June and December-January, especially just before the Tet New Year. For poor groups have wage labour in ceramic Bat Trang as carry soil and coal and rich people work in Hanoi for government. All groups mentioned tired, fever in summer and changing weather, cold and cough in children in spring. Poor men mentioned their health is effected by pesticide using for ornament kumquat in summer.

3.2 Group Activity Profile

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

Poor Women

Names Activities	Dinh Thi Mau	Trieu Thi Bo	Nguyen Thi Lien	Nguyen Thi Quy	Nguyen Thi Tam	Total
Rice cultivation	4	5			4	13
Field crops	1	4	4	3		12
Fruit tree	3	3		4	3	13
Ornammental plant			6	2		8
Livestock	3	3	5	5	5	21
Medical tree		1			1	2
Take care children	4	4	5	6	4	23
Wage lobar	5				3	8
Total	20	20	20	20	20	100

Poor Men

Names Activities	Nguyen Van Hien	Nguyen Duong Duc	Le Van Sao	Le Van Khiem	Duong Duc Chiem	Total
Field crops	7	2	10	8	4	31
Livestock	3		4	2	4	13

Rice cultivation		2		3		5
Wage labor	6	9		3	6	24
Take care children	4	7	6	4	6	27
Total	20	20	20	20	20	100

Rich Women

Names Activities	Trieu Thi Mien	Vu Thi Tam	Nguyen Thi Ngoan	Nguyen Thi Huyen	Nguyen Thi Sinh	Total
Field crops	8	5	6	4	4	27
Livestock	3	4	3	3	5	18
Rice cultivation	3	3		2		8
Small trading			6	7		13
Fish culture		2			8	10
Take care children	4	4		4	3	20
Salary	2	2				4
Total	20	20	20	20	20	100

** Field crops include: Kumquat, organ, bean, maize... *Service include: Small trade, caring land for planting field crops, small business.*

Rich Men

Name Activities	Chu Van Cao	Nguyen Van Hue	Nguyen Van Hinh	Chu Van Trang	Nguyen Van Tuong	Total
Field crops	10	11	15	14	11	61
Rice cultivation	3	1	1	2	1	8
Raise livestock	5	3	2	2	6	18
Fish culture	1					1
Wage labor			1	1		2
Take children	1	5	1	1	2	10
Total	20	20	20	20	20	100

These are summarised in Table 3.1. It will be noted that rich and poor men households rank field crop high on the list, for poor women separated field crop into fruit plant, medicine tree and field crop for other groups they combined all those activities in field crop. Take care children is also an important activity, for poor women rank this activity highly. They place relatively little importance on wage labour. Rich groups mention fish culture, but it is not high ranking. All groups rank rice cultivation nears the end of list.

Table 3.1. Activities summary:

FAIRLY POOR		FAIRLY RICH	
Women	Men	Women	Men
1. Take care children 2. Livestock 3*. Fruit tree plant 4*. Rice cultivation 5. Field crop 6**. Wage labor 7**. Ornament tree 8. Medicine plant	1. Field crop 2. Take care children 3. Wage labor 4. Livestock 5. Rice cultivation	1. Field crop 2. Take care children 3. Livestock 4. Trading & Wage labor 5. Fish culture 6. Rice cultivation 7. Salary	1. Field crop (fruit, ornament, field) 2. Livestock 3. Take care children 4. Rice cultivation 5. Wage labor 6. Fish culture

Several other points are worth noting. These include:

- The important of fruit tree for all 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, poor women group mentioned it is more important than other groups, for poor women put this activity on the top of activity list.
- Rice cultivation exists in this area, but it is not an important for income.
- For wage labour activity is not important in this area because with field crop activity need more time than other activities, so that most of time in all year is busy.
- 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, only rich group mentions it.

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	Available	Cheap	Delicious	Easy buy	Few bones	High nutrient	Total
Crab	6	5	4	3		2	20
Snail	6	7	3	3		2	21
FW. clam	4	6	3	3		2	18
Shrimp	2		4			2	8
Common carp	1		4		1	2	8

Indian carp	2	2	2	2			8
Silver carp	3	6		3			12
<i>Car. auratus</i>	4	7		3			14
<i>Wallago attu</i>	1		3	1	2	3	10
Catfish	1		3	1	3	3	11
Grass carp	1		3	1	2	1	8
<i>Anabas tes.</i>	3	4	2	3		2	14
Snake heah	1		5		2	2	10
Small shrimp	6	6		2			14
Tilapia			1				1
<i>Squaliobarbus curriculus</i>	3	2	1	1	1	1	9
<i>Hemiculter leucisculus</i>	4	3	1	4	2		14
Total	48	48	39	30	13	22	200

Figure 4. 2: Poor Men

Criteria Species	Tast y	Easy catch	Availa ble	Cheap	Few bones	Total
Black carp	5	1	1	1	4	12
<i>Wallago attu</i>	3	1	3	1	3	11
Water snake	2	1	2	1	3	9
Catfish	3	1	2	1	3	10
<i>O. pagalense</i>	3	1	2	1	3	10
<i>Misguruus fossilis</i>	3	1	1	1	3	9
<i>Ana bas tes.</i>	3	2	3	3	2	13
Silver carp	2	3	3	3	2	13
Snake head	5	1	1	1	3	11
Crab	1	3	3	2	2	11
Indian carp	3	3	3	2	2	13
Common carp	3	1	2	2	2	10
Small shrimp	1	3	3	4	2	13
Shrimp	4	2	2	1	4	13
Grass carp	3	3	3	2	3	14
FW. clam	1	1	1	1	3	7
<i>Carassius auratus</i>	1	2	3	3	2	11
Snail	1	2	1	4	2	10

Total	47	32	39	34	48	200
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Figure 4. 3: Poor Women

Criteria Species	Few bones	Tasty	Easy catch	Easy culture	Grow fast	High value	Total
Grass carp	3	3		5	6	6	23
Common carp	2	5		3	3	6	19
Indian carp	2		4	2	4		12
Catfish	4	3				4	11
<i>Misguruus fossilis</i>	4	4	1			4	13
<i>O. pagalense</i>	4	4	1			4	13
Snake head	4	4	1	2	1	5	17
Silver carp		1		3	2	2	8
Tilapia		2		4	2	1	9
Carassius auratus		2	3			1	6
Shrimp	4	4	4			4	16
Crab		2	5			2	9
Water snake	4	3	2			2	11
Frog		5	5			2	12
Snail	3	2	5			1	11
Fw.clam	4	2	3			1	10
Total	38	46	34	19	18	45	200

Figure 4. 4: Rich Men

Criteria Species	Grow fast	Delicious	Fit price	Available	Few bones	Total
Grass carp	6	5	5	3	4	23
Common carp	4	6	3	4	4	21
Silver carp	5	2	3	2	3	15
<i>Anabas tes.</i>		1	1	2	2	6
Tilapia	2		1	1	4	8
Indian carp	2	6	7	5	2	22
Clarias catfish	2	2	2	1	2	9
Snake head		6	3	3	4	16
<i>O. pagalense</i>		2		1	4	7

<i>Mis. fossilis</i>		2	2	1	1	2
Crab		4	4	3	1	12
Snail		2	4	2	1	9
Shrimp		3	4	2	2	11
Big FW clam		1	4	2	1	8
<i>Carassius auratus</i>		1	3	3		7
Frog		1		2	2	5
Water snake		1	1	2		4
<i>Clupanodon</i> sp.		1	1	1		3
Hem. <i>leucisculus</i>			2	2		4
Small wild fish			2	2		4
Total	21	46	52	44	37	200

It will immediately be apparent that the ranking is similar in all groups. Poor women emphasised cheap wild species, but poor men and rich groups mentioned to fish culture. They liked fish culture due to wild fish is reducing and fish culture is available. Most people in this village mentioned grass carp. Rich groups emphasised common carp and poor groups emphasised *Anabas tes.* Men groups mentioned silver carp. For criteria, all groups mentioned delicious and few bones. Poor groups emphasised cheap, but for rich groups emphasised grow fast. For men mentioned easy catch due to sometime, they could catch wild fish in river.

Important Aquatic Animals - Summary:

Poor		Rich	
Women 17 Species	Men 18 Species	Women 16 Species	Men 20 Species
1. Snail	1. Grass carp	1. Grass carp	1. Grass carp
2. Crab	2. Silver carp	2. Common carp	2. Indian carp
3. Clams	3. Shrimp	3. Snake head	3. Common carp
4. <i>Carassius auratus</i>	4. Small wild fish	4. Shrimp	4. Snake head
5. <i>Anabas tes.</i>	5. <i>Anabas tes.</i>	5. <i>O. pagalense</i>	5. Silver carp
6. <i>Hem. leucisculus</i>	6. Black carp	6. <i>Misgurnus fossilis</i>	6. Crab

Important Criteria - Summary

Reasons	Criteria	Poor		Rich	
		Women	Men	Women	Men
Consume	Available	48	39		44
	Few bones	13	48	38	37
	Cheap	48	34		
	Delicious	39	47	46	46
	Suitable price				52
	Easy catch		32	34	
	Easy buy	30			
	High Nutrient	22			
Culture	Grow fast			18	21
	Easy culture			19	
	High value			45	

5. Aquatic Animal Seasonality and Trends

From figure 5.1-5.4 shown that poor women group likes cheap wild fish and they could catch some in rainy season, at the time the price is cheap. Rich people like cultured fish due to available, tasty. They have more fish due to buying in harvesting season. Most groups mentioned that they bough more fish in spring and winter, this point is suitable with stocking and harvesting season. In rainy season, they could catch some cultured fish due to fish escaped from pond culture.

6. Aquatic Animal Trends

Poor Women

Periods Species	Before 1960	60-70	70-80	80-90	90-95	95-2000	After 2000
Snail	At that time, not many people own wild surface water and catch them. Good Environment			Decreasing Quality of environment went down rapidly, increasing population, area of surface water was decreased, more people exploited			
Crab				Decreasing			
FW.clam				Decreasing			
<i>Carassius auratus</i>				Decreasing			
<i>Anabastes.</i>				Decreasing			
Small shrimp				Decreasing			
<i>Hemiculter leucisculus</i>				Decreasing			

Poor Men

Periods Species	Before 1960	60-70	70-75	75-80	80-85	85-90	90-95	95-00	After 2000
Grass carp				Increasing had seed		Increasing more people cultured by high capacity			
Silver carp	Increasing Few people cultured			Increasing Few people cultured		Increasing cultured more			
Shrimp	Increasing			Decreasing using pesticide and insecticide Pollute environment					
Small wild fish	Increasing			Decreasing					
<i>Anabastes.</i>	Increasing no using agriculture chemicals			Decreasing Using pesticide and insecticide Pollute environment					
Black carp	Stable								Dec. Slow grow

Rich Women

Periods Species	Befor e 1960	60- 70	70 - 75	75- 80	80- 85	85- 90	90- 95	95- 00	Agter 2000
Grass carp	Decreasing No seed and not many people cultured				Increasing By being invested, more people cultured, high capacity				
Common carp	Increasing A lot of fish in nature & good env.					Decreasing Environment was polluted, using pesticide, exploiting electric shock.			
Snake head	Similar common carp								
Shrimp	Increasing Similar common carp					Decreasing Environment was polluted, using pesticide, exploiting electric shock.			
<i>O. pagalense</i>	Similar shrimp				Similar shrimp				
<i>Misguruus fossilis</i>	Similar shrimp				Similar shrimp				

Rich Men

Periods Species	Befor e 1960	60 - 65	65- 70	70- 75	75- 80	80- 85	85- 90	90- 95	95 - 00	After 2000
Grass carp	Few	Increasing Cultured more								
Indian carp	Similar Grass carp									
Common carp	Few	Normal	Stable				Increasing High value, cultured more			
Snake head	Few	Stable						Increasing High value		
Silver carp	Few	Increasing Cultured more, grow fast								
Crab	A lot	A lot				Decreasing: many people exploited, using pesticide				

All groups in the village mentioned that wild fish are reducing due to using pesticide, chemical, exploited by electric shock, pollute environment and reducing water area. But fish culture is increasing due to culture with high stocking, available seed and high technology is applied. Only rich men mentioned that snakehead is increasing due to its value so that some people can rise. and some of wild fish as shrimp, Hel., snake head, but recently wild fish have been decreasing

7. Cross checking

7.1 Transect Walk

Head of village taken us to around the village with the map and shown well, communal house, kumquat field, ponds, people living, rice field has wild fish & 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:

- All groups have small land for rice cultivation, would they like some more land for this activity? Their answer no due to lower income from rice cultivation than other activities. Field crop includes medicine tree, fruit plant, ornament kumquat and vegetable. This activity is an important economic activity in this area for all groups. Livestock and wage labour are less important activities in this area. Only, rich groups mentioned fish culture and this activity is not common and not high income.

- Most groups like cultured fish due to available and tasty, especial grass carp. Poor women liked cheap wild fish, rich groups liked common carp and snake head. This point is suitable with their income.

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, International women day, festival, kill insect day, mid month day, children new year and Tet.
- All groups have small field for rice cultivation activity and this activity brought low income. Poor households have larger land for rice field than rich households, opposite rich households have more land for field crop for ornamental kumquat, fruit plant than poor households.
- The most important activity is field crop includes medicine tree, ornamental kumquat, fruit plant and vegetable. Fruit trees are planted in February and harvested in the end of year, maize, soil bean are also planted in February and harvested in May. Vegetables are planted after harvesting maize and soil bean and harvested around New Year. Medicine trees are also planted in February and harvested in the end of year.
- Poor people did not mention fish culture and only rich people mentioned this. No fishing activity is emphasised in all groups.
- Most groups like cultured fish due to available, tasty and grow fast grass carp. Rich people like common carp and snake head, poor women like cheap wild fish. Wild fish

are reducing and fish culture are increasing, but for rich men mentioned snakehead is increasing due to high value so that some people developed it.