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

Case Study V2:
Xom Cuoi, Yen Tang village, Bac Phu commune, Soc Son district

1. Introduction

1.1 Schedules and Persons Involved

This study was carried out between June 4 and June 6, 2001. The RIA1-AIT team first visited the village on June 4 and worked on the PRA process on June 5. After collating and translating information obtained at RIA1 on June 6, the team returned for a 'debriefing' with villagers on June 7. The RIA1-AIT for the fieldwork consisted of

1. Kim Van Van
2. Nguyen Chien Van
3. Nguyen Huu Hoa
4. Bui Ngoc Thanh
5. Jack Morales
6. Caroline Soubry

1.2 District Commune Description

Soc Son district is the northern most district of Hanoi Cioty. It lies some 40 kms north of Hanoi city centre and surrounds Noi Bai International Airport. The total area of the district is 506.5 km^2 and the population 240,950 people. Despite its location, 87.4% of the households of the district are engaged in agriculture and the average per capita income of the district is a rather low VND2.596 million (US$180). 8.6% of the households in the district are classified as poor.

The district was chosen as representative of the drier fringe of the Red River delta and is sometimes classified as midland. The district slopes steadily from west to east. The eastern edge of the district in fact has a line of small hills, rising to around 550 feet above sea level with 5 communes situated in this area. The other 15 communes are entirely lowlands, but a group of 6 communes in the southest lie alongside the Cau river and suffer from overbank flooding from the river. It was decided to select three communes along a transect from west to east, Minh Phu in the foothill area; Phu Linh in the intermediate lowland areas and Bac Phu in the lowest lying area along the river. The characteristics of these communes are summarized in Table 1.

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

Variable	Minh Phu Commune	Phu Linh Commune	Bac Phu Commune
Topography	Midland	Lowland	Very

			Lowland
Total Area (km2)	20.35	14.42	10.80
Land Area (ha)	682.4	1067	731.0
Agricultural Area (ha)	203.5	463	731.0
Agricultural Households (%)	96	97	98.5
Population Density	466	529	776
Poor Households (%)	16.6	3.5 (old), 8.5 (new)	14.0 (o), 29 (n)
Water Surface Area Used (ha)	7.5	4 lakes	38.0
Water Surface Area Unused (ha)	25	No data	43
Aquaculture Systems	Extensive	Extensive	Extensive
Species Culture	Grass, silver, common and Indian carps	Grass, silver, common and Indian carps	Grass, silver, common and Indian carps
Wild fish	No data	No data	River catfish

Source: Soc Son 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 Nguyen Trung Tinh, vice chairman & Mr. Nguyen Huu Thang, agriculture of Bac Phu commune for the morning of June 4. The commune is rising around 7 m above sea. The details of the constituent villages of the commune were obtained. Bac Phu Commune comprised 4 villages as follows:

1. Xuan Tang   375 families
2. Yen Tang   690 families
3. Phu Tang   390 families
4. Bac Vong   360 families

It was stated that Yen Tang village contained large number of poor households & high density of population, 98.5% of the households of the commune are engaged in agriculture, especially the end group (Xom Cuoi) of the commune contained the greatest number of poor households. They were poor from long time, their main income from agriculture but over flooding often occurred and one third of land area is used for one crop per year & poor land with low yield. Xom Cuoi group has 131 households was chosen.

The team immediately secured an appointment with Ms. Dao Thi Doan, Labour Party, Women Union of commune with respondent of Yen Tang village & She lived in the group. On the basic 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. Phuong (around over 50 old years retired from army) and Mr. Ket (around 60 old years) after that it was supported by two ladies, in their house the meeting was taking place. Xom Cuoi of Yen Tang village sits on a ridge of low land surrounded concentrically by low fields and ponds. Beside of the village is Asphalted road through communes in eastern of Soc Son district. 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 Nguyen Van Bay, Mr Nguyen Xuan Duc, 67& 62 year old men and Ms. Dao Thi Doan, a 53 year old woman. They stressed political & development events. The village was established for 170 years ago. French army came the village in 1940. At that time the people were very poor eating almost some food of pig. The revolutionary groups were formed in 1945. French army fired 4 houses, get livestock & destroy everything of the village in 1949, at the time there were 25 households. In 1954, the yield of agriculture was very low only around 70kg of rice per 360m^2 per crop. At that time the people lack knowledge, their living up to ponds and lakes. In 1965, the road through village was built.

Fighting with the United States and American bomb in 1968. At the time pesticide was used, until 1970, cement was used for building houses and standard living was improved from 1990s, 2 crops were carried with high yield and more children were gone to school and until 1993 electricity was installed to the village.

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

Rank	Trial 1 Dao Thi Doan Women Union Leader	Trial 2 Nghiem Xuan Duc Nguyen Van Ket	Trial 3 Nguyen Thi Y Nguyen Thi Bien
1	Widow / single parent Poor health Poor economic Some share home with others 4 months per year, food is insufficient No access to formal credit Get support from government Borrow money from other families Wage labour	Some have no house or very simple house Some just married & separated from a big family Normal health Lack food 4-5 months per year Wage labour to buy rice etc when no food	Lack food around 6 months per year Income from rice cultivation & wage labour (construction & catch AAs) Some share house with relatives Most children finish primary

	(construction) Some have risk (problems)		school Very simple house Many young couples from poor families Some widows Lack of knowledge Problems in family eg divorce, single parents etc Wage labour
2	Just separated from large family Lack knowledge on farming Lots of children Poor education Lack of labour Main income from ricefield Lack investment Simple house (small) Not enough farm equipment Wage labour Lack food 3 months per year Lower yield from ricefields Children can only go to lower level of education Children catch aquatic animals in ricefields Normal (good) health	Fairly poor Lack food for 3-4 months per year Have to borrow farm equipment from others Wage labour Children only primary education, but some not enough money for this Normal health Lack some furniture	Lack food 3-4 months per year All go to wage labour (one member of family at all times), e.g. carry bricks, construction Even children do wage labour Children catch snails and crabs to sell Few HHs have B&W TV
3	Majority work in the rice fields & some as farm labour Dependent on commune staff Lack knowledge Normal home Production just enough for consumption Have livestock Good health	Sometimes have money, sometimes lack money Some HHs have B&W TV, small farm with few livestock Lack of investments Wage labour in free time (more than group 4 & 5)	Most HHs go to wage labour, all year Lack food about 2 months per year Some children finish secondary school, majority only primary school Share farm equipment
4	Normal income Enough labour Can save some money Livestock Most HHs have level 4 house	Fairly rich Nearly enough furniture Some HHs have motorbike and colour TV	Income from livestock and rice Have enough food No spare money

	Off-farm labour (construction - bricks) Ricefield Normal health	Fewer farm equipment than group 5 No need for loans Have control over finances Some wage labour	Children finish secondary school Generally have 3 children Normal house (low) Some wage labour (brick carrying etc) Production is enough for consumption
5	Some are retired from the government Most HHs have 1 high value livestock: Cow, pigs Trading Good knowledge Few children Some have motorbike Good house, enought farm equipment 2-wheeled tractor Farming is a major source of income Normal health	Farm equipment Flat house Children can have higher education Have motorbike and truck Normal health Spare food Enough furniture Some wage labour (with farm equipment)	Good economics (can save money) Government employed Major income from rice. Livestock
6			Good farm equipment (can use for wage labour) Big, flat house Trading Government employed

- Social Structure of the Community: Community includes 4 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.

2.3 Summary/ Key Points
- Poor households in the village: some widows, divorce, single parent, just get married and separated from big families. They are very poor about economics, some poor health and often lack knowledge, lack food for 4-6 months/ year. Some HH get supported form government and have to borrow money from other families. They have simple houses or not.
- Fairly poor households: Still lack knowledge, poor education, many children with small houses, lack food for 3-4 months/year, not enough farm equipment & furniture. Their children often catch aquatic animal in rice field.

- Normal households: They have normal houses with normal farm equipment & furniture, enough income for consumes, enough food and only lack investment for production.
- Fairly rich households: Spare some rice, but not much money to spare, normal income, no need a loan, enough equipment & furniture.
- Rich households: They often are good economics, farm equipment & furniture & good houses as flat roof. Some of them have motorbike, wheeled tractor government employed or retired, trading, good knowledge,

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.
* For weather: all groups concerned to sun & rain: Spring or Light rain occurred in moths 1, 2 (Equal Feb, March), sun and rain in months 3, 4 (April, May) and a lot of sun, heavy rain and storm in moths 5,6,7 (June, July and August). In months 8,9 and 10 were less rain, cool and dry. No rain or light rain and cold in month 11, 12. For poor groups had not concerned to temperature, and all groups had not concerned to fog.
* For social events: all groups had the same ideas about social events as New year, old people festival, Tet 3/3, kill insect day 5/5, mid month 15/7, children new year 15/8, New rice Tet 10/10, wedding and ceremony seasons. For poor women more concerned to children's vaccine.
* For economic activities: all group have rice cultivation, field crop, livestock. two rice crops: transplant rice in month 1 and 6, fertilise in month 2, 3 and 7, 8 and harvest in months 4-5 and 9-10. For field crop: bean, peanut plant in spring and harvest in summer after that sweet potato and winter crop are planted. For livestock in poor groups are only duck, chicken and pig rearing but rich groups have more cattle and they are rearing and harvest all year, more chicken and pig are harvested before new year.
- Fish culture activity occurred in men groups, but poor men stocked fish in month 2 (March) and harvested in month 12 (January) and rich men stocked and harvested earlier one month.
- Fishing activity occurred in rich men and poor women groups.
- Poor men have wage labour activity.
* For busy and high income often occurred in rice harvesting and transplant, harvest peanut, bean and the end of year.
* The ideas of most group: flu and fever disease often occurred in months 4,5 and 8, but rich men group said the disease occurred earlier and later one month (month 3 and 9).
* Migration: all groups mentioned wage labour (make and carry bricks) in free time of months 2, 3 and construction in winter.

3.2 Group Activity Profile

Poor Women

Names \ Activities	Nghiem Thi Xuan	Nguyen Thi Bien	Nguyen Thi Dung	Hg Thi Guan	Nguyen Thi Thuc	Total
Rice cultivation	6	8	5	6	5	**30**
Field crops	3	4	4	4	3	**18**
Livestock	3	4	5	4	4	**23**
Wage labour	4	2	2	2		**10**
Fishing					4	**4**
Raise children	4	2	4	4	4	**18**

Poor Men

Names \ Activities	Le van huong	Le van truong	Nghiem van tam	Ng Van Phuc	Ng Van Sy	Total
Rice cultivation	6	5	6	6	5	**24**
Field crops	3	4	4	4	3	**18**
Livestock	3	3	4	4	3	**17**
Raise children	3	2	3	2	3	**13**
Wage labour	5	6	3	4	3	**21**
Fish culture					3	**3**

Rich Women

Names \ Activities	Nguyen Thi Huong	Tran Thi Tien	Nguyen Thi Sang	Nguyen Thi Xe	Nguyen Thi Tuat	Total
Take care children	3	4	4	4	5	**20**
Cooking	2	2	2	2	2	**10**
Livestock	3	3	3	3	4	**13**
Rice culture	4	3	4	4	3	**18**
Field crop	3	3	3	3	2	**14**
Wage labour	2	2			1	**5**
Market	3	2	2			**13**
Fish culture			2			**2**

Rich Men

Names \ Activities	Nguyen Van Loc	Nguyen Van Lai	Nguyen Van Bac	Nguyen Van Nghia	Nguyen Van Vung	Total
Rice cultivation	7	7	8	6	5	**33**
Field crop	3	3	3	3	3	**15**
Livestock	23	4	4	3	3	**17**
Fish culture				2		**2**
Fishing					2	**2**
Children	3	4	5	4	5	**21**
Wage labour	4	2		2	2	**10**

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These are summarized in Table 3.1.
Table 3.1. Activities summary:

Poor		Rich	
Women	**Men**	**Women**	**Men**
Rice cultivation	Rice cultivation	Take care children	Rice cultivation
Livestock	Wage labour	Rice cultivation	Take care children
Field crops	Field crops	Field crop	Livestock
Take care children	Livestock	Livestock	Field crop
Wage labour	Take care children	Market	Wage labour
Fishing	Fish culture	Cooking	Fish culture*
		Wage labour	Fishing*
		Fish culture	

This land area is very low, so that the activity for rice cultivation is very important for all households in the village and it is main income. For rich households spend more time for take care children than poor households, especially poor men spend little time for this activity and spend more time for wage labour to earn money. Most of groups have fish culture except poor women. Field crop & livestock are second important activities in agriculture.

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 of aquatic animal species list was supported by all groups after that gave mark to know which species is more important follow criteria of all groups.

Fig. 4.1 Poor Women

Criteria Species	Easy catch	High value	Easy buy	Expensive	Delicious	Total
Indian carp	2	2		2	1	**7**
Grass carp	3	3		3	1	**10**
Common	3	3		4	2	**12**
Snake head	3	3		5	4	**15**
Big FW clam	5	4	2			**11**
Clarias Catfish	3	2		2	3	**10**

Rasborinus lineatus	5	1	2			**8**
Glossogobius giuris	2	1		1	1	**5**
P. fulvidraco intermedius	2	2		1	1	**6**
O. pagalense	2	1		3	1	**7**
Erythroculter spp.	5	2	2			**9**
Long FW clam	5	2	1			**8**
Car. auratus	5	3	2			**10**
Crab	4	3	2		2	**11**
Shrimp	4	2	2		2	**10**
Maropodus opercularis	3					**3**
Anabas tes.	5	2	1			**8**
Small FW clam	4	2	3		1	**10**
River catfish	1	1	2			**4**
Mis. fossilis	2		1			**3**
Silver carp	4	3	4			**11**
Frog	2	2		1	1	**6**
Water snake	1	3		1		**5**
Snail	4	3	4			**11**
Total	**79**	**50**	**28**	**23**	**20**	**200**

Fig. 4.2 Poor Men

Criteria / Species	Easy culture	Cheap	Easy catch	Grow Fast	Expensive	Delicious	Total
Common carp	4	0	0	4	2	3	**13**
River catfish	3	3	0	0	0	3	**9**
Indian carp	6	0	0	3	2	2	**13**
Grass carp	4	0	0	2	4	3	**13**
Silver carp	4	5	0	5	0	0	**14**
Catfish	0	0	2	0	2	1	**5**
Crab	0	3	5	0	3	3	**14**
Small shrimp	0	8	6	0	0	0	**14**
Snail	0	6	3	0	0	0	**9**
Eel	0	0	0	0	2	3	**5**
Car.	0	6	2	0	0	0	**8**

							Total
auratus							
Shrimp	0	4	4	3	2	2	**15**
Big FW Clam	0	6	5	2	3	2	**18**
Frog	0	0	0	0	3	5	**8**
Anabasstes.	0	7	6	2	0	2	**17**
Snake	0	0	5	0	1	2	**8**
Mis. fossilis	0	0	3	0	2	3	**8**
Snake head	0	0	3	0	3	3	**9**
Total	21	48	44	21	29	37	**200**

Fig. 4.3 Rich Women

Criteria / Species	Easy catch	Delicious	Easy buy	Grow fast	Easy culture	Nutritious	Cheap	Expensive	Total
Car. auratus	6	5	7				5		**23**
Shrimp	4	5	4			5		3	**21**
Indian carp		4	5	5	3		5		**22**
Silver carp		4	5	5	5		4		**23**
Eel		4				2			**6**
Mis. fossilis		2							**2**
Snail / clam	4		4				5		**13**
River catfish	2		2						**4**
Tilapia	2		2			3			**7**
Crab	4	3	5		4		5		**21**
Anabastes.	4	4	2						**10**
C. carp	0	5	4			6		2	**17**
C. Catfish	5	5						2	**12**
Snake head		6			5	6		2	**19**
Total	31	47	40	10	17	22	24	9	**200**

Fig. 4.4 Rich Men

Criteria / Species	Easy catch	Delicious	Cheap	Easy culture	Expensive	Easy sell	Total
Crab	5	2			2	3	**12**
Snail	3	2	3			3	**11**

	C1	C2	C3	C4	C5	C6	Total
Shrimp	4	3		3		3	**13**
Silver carp	3	1		4		4	**12**
Car. auratus	3					3	**6**
Anabas tes.	3	1				3	**7**
C. Catfish	2	3		1	3	2	**11**
Indian carp	3	2		3	1	2	**11**
Grass carp	3	2		3	1		**9**
C. carp	3	3		2	2	2	**12**
Snake head		4			4	2	**10**
River catfish		3			2	3	**8**
P. fulvidraco intermedius		3			2	2	**7**
M.opercularis	3						**3**
Ery. recurvirosteis	2	2	3			2	**9**
Ras. lineatus	2						**2**
O. pagalense		3			4	3	**10**
Mis. fossilis		3			2	2	**7**
Frog		4			4	2	**10**
Big FW clam	4	3				3	**10**
Long FW clam	4	3				3	**10**
Small FW clam	4	3				3	**10**
Total	**51**	**50**	**6**	**16**	**27**	**50**	**200**

Important Criteria - Summary

	Criteria	Poor		Rich	
		Women	**Men**	**Women**	**Men**
Consume	Delicious	20	37	47	50
	Easy catch	79	44	31	51
	Easy buy	28		40	
	Cheap		48	24	6
	High Value	50			
	High Nutrient			22	
	Easy sell				50
Fish culture	Grow fast		21	10	
	Easy culture		21	17	16
	Expensive	23	29	9	27

For criteria as delicious, easy catch and expensive were mentioned in all groups, beside most groups liked cheap also due to they are very poor people. Easy culture was not concerned by poor women.

Important Aquatic Animals - Summary:

Poor		Rich	
Women	**Men**	**Women**	**Men**
24 Species	18 Species	14 Species	22 Species
Snake head	Big FW clam	Silver carp	Shrimp
Common carp	*Anabas tes.*	*Carissius auratus*	Crab
Crab	Shrimp	Indian carp	Silver carp
Silver carp	Crab	Shrimp	Common carp
Big FW clam	Silver carp	Crab	Snail
Snail	Common carp	Snake head	Clarias catfish

It will immediately be apparent that the ranking is not rather different between the different groups. All groups mentioned wild fish as crab and cheap or available cultured fish as silver, common and Indian carp. Shrimp and common carp were mentioned in most groups due to good tasty and snake head only mentioned in women groups, Big FW clam was mentioned in poor groups because it was available, cheap and easy catch. This area is very low land so that most people can catch wild fish in field, canal.

5. Aquatic Animal Seasonally

From figure 5.1-5.4 shown that for all groups like wild fish due to cheap, available, easy catch & tasty and some cheap, available and common fish culture. Most people have wild fish due to catch them in field. The poor groups often catch wild fish in field so that they described aquatic animal seasonality was more detail than rich groups. For rich group often mention buying fish in market so that for describeing aquatic animal seasonality was very simple.

6. Aquatic Animal Trends

From figure 6.1-6.4 shown that most groups mentioned that decreasing in wild fish due to using pesticide, chemical in agriculture, built dyke, polluted environment and bad equipment in exploiting. Increasing in cultured fish due to applied high technique in culture and available seed, except snake head intend increasing due to its high value so that many people want to develop this species by rearing.

7. Cross checking

7.1 Transact Walk

Mr. Phuong and some young men taken us to around the village with the map and shown where their fields, ponds, people living, how about livelihoods of rural people where fields have wild fish & where water resources run to canal system and where they could catch wild fish.

7.2 Farmer meeting

- The first of all, Mr. Van introduced why Xom Cuoi of Yen Tang village was chosen for PRA after that Mr. Thanh summarised report which had done 2 days a go.
- Shown the map of their village which some people had drawn 2 days a go 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 animals they like & some questions were talked out:
- The land for each person in this area is 720m^2 (it means larger than other areas) but the land is very poor and low so that over flooding often occurred and main income of them from agriculture lead to poor. Event for young children were born after 1993 without land lead to the young households get more and more difficult in finance. Lucky for them this area is low land so that poor people can earn money by catch snail and crab in field. For poor men group talked their living standard would be improved or not depend on wage labour.
- In the meeting, the poor women group changed position of wage labour activity from fifth to second after rice cultivation because they mentioned wage labour brought higher income than other activities.
- Event low land, but when PRA group mentioned changing purpose in land using from rice cultivation with low income into rice fish or fish culture with high income. The answer is not due to each household has small land in each field and the difference about soil quality so they don't want to change each other to get large land.
- All group in the village liked wild fish because available, easy catch in field.
- Most wild fish are decreasing due to, pesticide, chemicals used in agriculture, polluted environment and damaged equipment in exploiting. Rice field contained pesticide and chemicals make damage for aquatic animal.

8. Summary/ Key Points

- Most of groups have same ideas about weather as temperature, rain, sun, wind and storm, about social events as old people festival, tet 3/3, pagoda day, kill insect day 5/5, mid month of July, children new year, wedding and ceremony seasons.
- Most groups have two rice crops: Transplant in month 1 and 6 and harvesting in months 4-5 and months 9-10. The most important activity was from rice cultivation after that was field crop and livestock. For poor groups, the wage labour is very important activity in livelihood because they are main labour and main income to

increasing living standard. This activity is not important with rich groups.. The rich groups spend more time for take care children than poor groups.

- Fish culture activity was mentioned in men groups and fishing was only mentioned in poor women and rich men groups. But poor men often involve fishing than others.
- All groups like wild fish, and cheap or available cultured fish. The criteria about aquatic animals are cheap, available, easy catch, easy culture, easy buy, tasty, few bones & high nutrient.
- Most wild fish are decreasing and cultured fish are increasing.