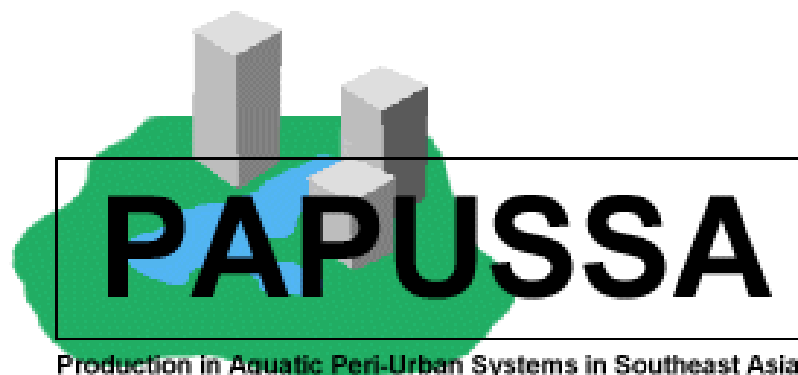


INCO : International Scientific Cooperation Projects (1998-2002)

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PCA in Bang B village , Hoang Liet commune,

Thanh Tri District - Ha Noi city

From 19th October to 3rd November, 2003

By

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Keywords: PCA, peri-urban, aquatic food, Southeast Asia, Hanoi, Vietnam

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TITLE : PRODUCTION IN AQUATIC PERI-URBAN SYSTEMS IN SOUTHEAST ASIA

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Acronyms and terms

ASC	Agriculture Services Co-operative
CPC	Commune People's Committee
PUAFPS	Peri Urban Aquatic Food Production Systems
RIA 1	Research Institute for Aquaculture No 1
WP	Work Package
NIHE	National Institute of Health and Epidemiology

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Abstract

Participatory Community Appraisal (PCA) of Bang B village Hoang Liet communities in Thanh Tri district were carried out by RIA 1 and NIHE teams in October, 2003.

The communities were chosen as representative for aquatic production systems within the peri-urban area of Hanoi including water mimosa, water dropwort, water cress, water morning glory and fish culture in wastewater.

The tools used in the PCA were Well-Being Ranking, Community Mapping, Timelines, Seasonal Calendars, Activity Matrix, Food Consumption, Resource Mapping, and Problem Ranking. The well-being ranking was carried out three times with different key informants before the actual PCA and was facilitated by 3 persons. The participants in the PCA were divided into 4 groups (worse-off womens, worse-off mens, better-off womens and better-off mens) to discuss the first of the 5 tools above. Only the fish and aquatic plant producer groups were then involved in the remaining tools: resource mapping and problem ranking.

Overall, Bang B village in Hoang Liet commune, has potential for selection in the next work packages. The communities are confronted with a number of issues such as health, urbanization, new production areas, conversion and changing usage of land areas, and relocation due to urban development. In the near future, it appears likely that Hoang Liet communes are going to become swallowed up into the into Hanoi's rapidly expanding urban core.

I. Introduction

The study was carried out for 3 days: 19th, 26th October and 3rd November, 2003 by a team composed of researchers from RIA-1 and NIHE. The RIA-1 team was composed of Nguyen Thi Dieu Phuong, Pham Van Trang, Nguyen Tat Hao and Kim Van Van while the NIHE team was composed of Phan Thu Phuong, Nguyen Dang Tuan, Nguyen Thuy Tram and Pham Duc Phuc. The NIHE team originates from the Institute's Division of Enteric Infections.

Bang B commune was first visited by Nguyen Thi Dieu Phuong and Kim Van Van on 19th October following making an appointment and contact with Ms. Luu Thi Sen (Head of Agriculture Cooperative). After initial findings that many households in Bang B village are working with aquatic production in wastewater and thus suitable with the objectives of research of the PAPUSSA project we then started the Well Being Ranking by key informants of Mr. Luu Bach Lua (head of village), Mr. Ngo Van Hoa (vice head of village) and Ms. Nguyen Thi Thanh (Party Committee Secretary) in Hoang Liet commune. Both RIA 1 and NIHE teams carried out the PCA process on 26th October in the meeting hall of the village with participation of 32 persons. Analysis of the information gathered was subsequently carried out at RIA 1 and NIHE during that week and then a 'debriefing' session with the villagers was carried out on the 3rd November 2003.

From the results of the PCA, the commune was chosen as being representative of aquatic plants (i.e. water dropwort, water cress and water morning glory) and fish culture in wastewater for further research of the PAPUSSA project.

II. Methodology

2.1 Wealth being ranking

Mrs Phuong had discussions with Ms. Luu Thi Sen, Chairwoman of Hoang Liet Agriculture Co-operative on 19th and 26th October 2003, and visited with her aquatic plant cultivation areas of the village, then met Mr. Ngo Van Hoa who was Vice Head of the village. Mr. Hoa gave us information on agricultural production of the 5 villages in the Commune: Bang B village was involved in aquatic plant cultivation, Inox (backyard coated metal construction workshops) and also aquaculture. Other villages such as: Bang A, Tu Ky, Phap Van, and Linh Dam have large

aquaculture production areas but are now going through development and construction of lakes, Yen So Leisure Park and significant areas of high tenement housing. After our discussion, we chose Bang B as being representative of an aquatic plant growing and aquaculture area in peri-urban Hanoi for our PCA.

First ranking: The participants were sorted by Ms Luu Thi Sen (Hoang Liet chairwoman of Agriculture Co-operative who lives in Bang B) with 3 groups.

Second ranking: The participants were sorted by Ms. Luu Thi Tam (She lives in Bang B and is a farmers representative with 4 groups

Third ranking: The participants were sorted by Ms. Nguyen Thi Thanh (Vice Secretary of village) with 2 groups.

Table 1: Wealth being ranking result

Group	Ms. Luu Thi Sen- the Hoang Liet chairman of Agriculture Co- operative	Ms. Luu Thi Tam Representative for farmers	Ms. Nguyen Thi Thanh is Vice Secretary of village
1 Poorest	In this group, rice and aquatic plant cultivation are their main jobs Some households are encountering social problems relating to gambling, alcohol addiction leading to children having to drop their studies.	Rice planting is their main job, so no accumulation of wealth, inherit little from parents.	Households working in agriculture. Some households have children or family members who studied at school. Some HHs have elderly people, and very few furniture.
2	Majority of farmers here are growing aquatic vegetables or involved in fish culture. They are hard working and have good awareness of their living situation. Generally they own furniture television, refrigerator, and telephone, Children are receiving good education	Have small children. Aquatic vegetable cultivation is their main job. No other supplementary jobs.	Income in this group is better than Group 1. The HHs here are good in following government's policies Own big house and furniture. Supplementary work in business and livestock.
3	To have developed	They have jobs such as:	

	sub-jobs such as: Lagoon renting, Livestock, carpentry. They are hard working, good in awareness of their situation. Furniture is available	fish culture, business, making wine and livestock. Some households have children in University who are married already.	
4 Most well off		Most of them have supplementary work in: Inox, making wine, business, carpentry, fish culture, growing aquatic plants. Some of them have their own business. They are good in business and hard working.	

All participants were then divided into 2 groups: Rich and poor and then by gender into 4 groups Rich men, poor men, rich women, poor women in order to better understand the community as a whole.

2.2. PCA Tools

Table 2: The PCA tools

Activity	Group composition	Details of the Methodology	Outcome
-----------------	--------------------------	-----------------------------------	----------------

Village mapping	The rich women's group consisted of 7 women (2 women doing vegetable cultivation, 2 women doing traditional handicraft (mechanism, inox steel carpenter) 2 women raising livestock and 1 woman planting rice. The rich men's group had 7 people with 3 people doing rice, steel inox , 2 people growing vegetables, 1 person making wooden electric board, 1 raising livestock. Poor men's group consisted of 6 people with 2 people planting vegetables, 2 people carrying out fish farming, 1 person doing both vegetable and rice cultivation, 1 person working in rice planting. The poor women's group consisted of 7 people with 3 people planting vegetables, 2 people raising cattle and 2 planting rice and making rakes.	Staff discussed participants the important positions in the village such as: roads, canals, pond systems, rice fields, vegetable areas, village centre etc.	A general map of the village was completed.
Timelines	All participants of 4 groups did timelines in separate groups.	To mark important events and points of history of the village	Overview on picture of village history
Seasonal Calendar	Carried out by participants of 4 groups	To describe different factors and activities throughout the year affecting peoples lives such as: Agricultural production, weather, diseases, cultural events, economic, politics, drought, water sources, and migration.	A general picture on different activities of village throughout the year.
Food consumption	All participants of group – same as above	Discussed foods eaten throughout different months of the year whether self-produced, or bought.	A comprehensive overview of the main food items that they consume and the differences of the food habits among well being groups.

Activities matrix	All participants of 4 groups	Required each participant to write down their daily activities and how they divide and spend their time during the average day.	To know activities of people in an average day
Resources mapping	All participants of 4 groups.	Each participant discussed matters relative to the resources(inputs/outputs of their production systems in the form of a flow chart e.g. aquatic vegetable cultivation and fish culture) Factors affecting the health of the community were also discussed and presented in this way.	Simply the 4 groups explain the inputs and outputs of the systems and also if they have data on health similar input and outputs.
Problem ranking	All participants of 4 groups.	All groups discussed and ranked the problems they encountered with fish culture and aquatic plant cultivation as well as the general and health problems of the community.	To identify and understand the most important problems which affect the health and well being of people in the community

III. Results of PCA

3.1 Description of the Villages

Location

The PCA was conducted at Bang B village of Hoang Liet commune located about 10 km south of Hanoi centre. To the south village is bordered by the Kim Nguu river, the east to Tam Hiep commune, and the west to Bang A village. Hoang Liet commune has 5 villages: Bang A, Bang B, Tu Ky, Phap Van and Linh Dam villages. It has a total land area of 0.48 km² of which agriculture occupies 0.41 km² (land for vegetable cultivation is 0.16 km², for rice cultivation is 0.25 km²) and aquaculture is 0.02 km² with 5 HHs producing fish in lakes.

Bang B village is a low lying land area where aquatic plant cultivation is being practiced such as Water mimosa, Water dropwort, Water morning glory and Water cress. The total land area of Bang B village is 48.44 ha, divided up into land vegetable cultivation of 15.7 ha, residential area of 5.20 ha, land cover water area of 1.82 ha and rice area of 25.20 ha.



Figure 1. Map of Bang B village which draw by Better-off mens group

Map of the commune

The commune map was drawn separately by 4 groups (worse-off womens, worse-off mens, better-off womens and better-off mens groups) and is shown in Figure 2. Figure 1 is an example of Bang B village’s map which drawn by better-off mens group.



Figure 2. Community Map Drawn by better-off women's group

Population

The total population of Bang B village, Hoang Liet commune is 1,381 people composed of 362 households. 50% of the communes households are engaged in aquatic plant cultivation and rice, with around 2.8% households only specialized in producing aquatic plants; the remaining households are involved in working with poultry, woodwork, bricklaying and producing domestic instruments from inox steel.

Ethnic composition

100% of people within the village are Buddhist and of the King ethnic grouping.

3.2 Historical profile of the community

To understand more about the communities, all PCA groups in Bang B commune discussed and drew historical timelines of their own villages. Historical events such as the establishment of land reform, electricity, village road building, school building, "Hire 10" applied (government law giving permission for Household the right that they can actively manage land use), and converting

lowland areas into fish culture from 1945, 1955, 1960, 1962 to 2003 are shown in Figures 2,3,4 and 5.

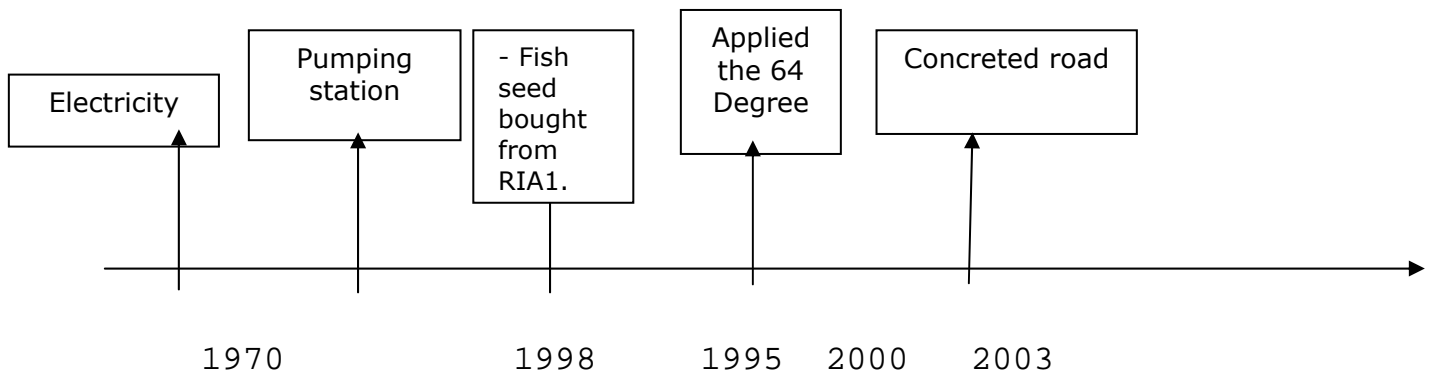


Figure 3. Timeline for the better off mens group

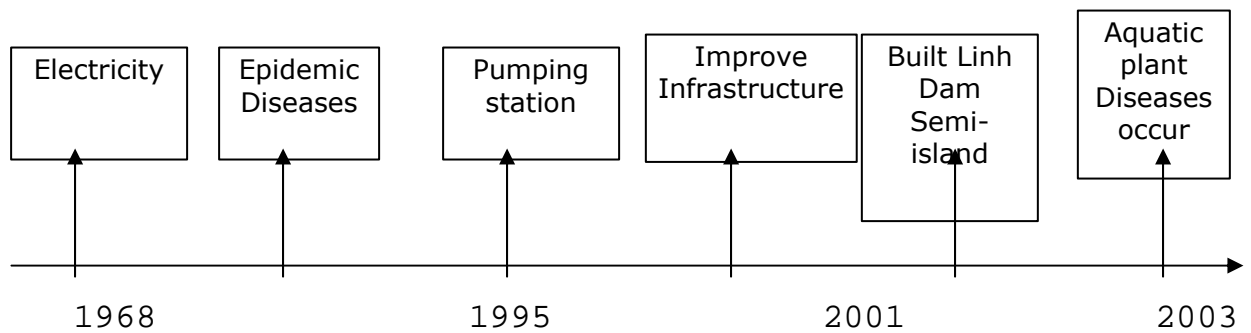


Figure 4. Timeline for poorer mens group

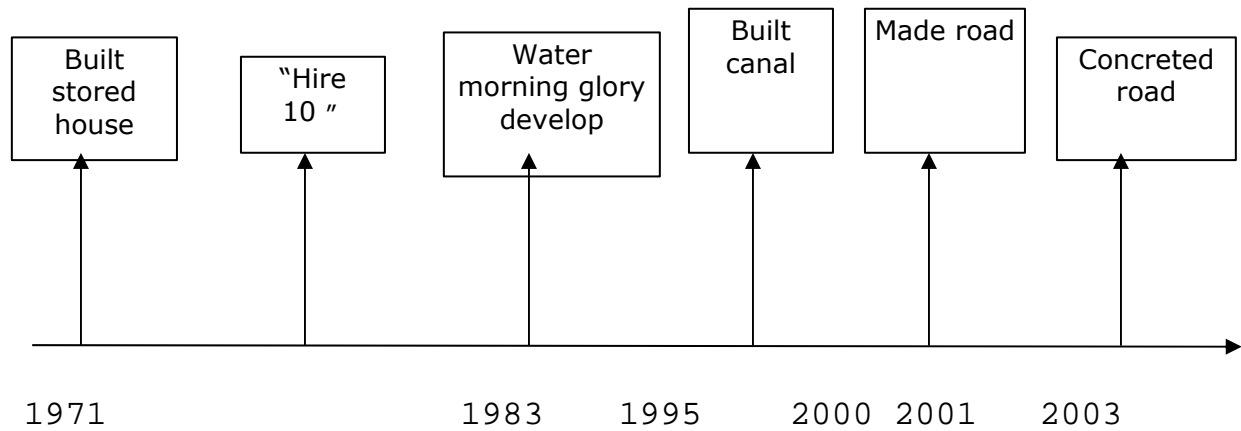


Figure5. Timeline for worse-off women's group

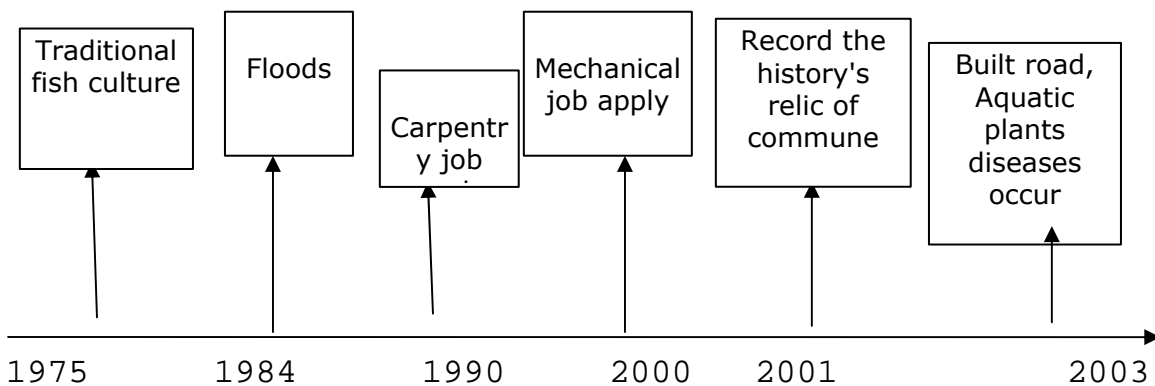


Figure 6. Timeline for Better off women's group

Before 1970, the majority of people worked in Agriculture, which at the time provided relatively low living standards and almost all farmers in the village cultivated rice in an agriculture cooperative. When electricity became available, life in Bang B changed considerably with the construction of a new water pumping station, canal, and road, and village centre, kindergarten.

In 1983 the new policy of "Hire 10" introduced by the government to give the land use rights to farmers. This was model to encourage farmers to increase productivity in crop plants (poor women's group mentioned). From 1987 to 1998 there was a program of mass construction in the

village building a new Pumping station for waste water to help agriculture. Traditional jobs in handicrafts such as embroidery were replaced by newer jobs in Inox metal work; hygiene paper (mentioned by both men's groups) other new agricultural activities mentioned included cultivation of morning glory and water dropwort plants and culture of new fingerlings in 1995. From 2000 to 2001, villagers built Linh Dam relic and children's kindergarten.

In 2003 village road was completed with concrete, upgraded/renovated canal and fish farmers for the first time bought in mono-sex (all male) tilapia from Research Institute for Aquaculture No.1 (all male tilapia grow faster and bigger in the ponds than mixed sex stocks) Generally the groups described similar historical events in the village however overall they produced a very comprehensive picture of the village's recent history.

Agricultural activities and practices in the village have been changing toward planting and cultivation of Water morning glory, water dropwort, water cress, water mimosa and fish culture in ponds compared to growing rice before.

3.3. Seasons, weather and climate

The seasons, weather and climate events identified by all groups. Like the rest of Viet Nam, the community has 4 seasons: spring, summer, autumn and winter. The Chinese calendar follows these seasons. The rainy season starts in January and February and peaks with heavy showers during March until August. The dry season is in September and October. November and December are the wintry months. The weather and climate events throughout the year are intrinsically related to economic activities, health, income/costs and other events of communities.

Table 3: The weather mentioned by groups

Group	Jan.	Feb.	Mar.	Apr.	May	Jun	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Better off mens	Rain, cold		Heavy rain, warm		Heavy rain, hot		Rain, storm, floods		dry		Less rain, very cold	
Worse-off mens	Humid, small rain, cold			Hot, heavy rain				Cool, dry			Dry, cold	
Worse-off womens	Humid			Rain, hot, storm				Cool, dry			Dry, cold	
Better off womens	Small rain, cold		Heavy rain, hot				Cool, storm			Cold, dry		

The weather was divided into 4 seasons: Spring, summer, autumn and winter. In general, all groups had similar views of the weather and seasons. For instance, from January to March the weather is humid and cold, from April to August hot, stormy and heavy rain, August to October dry, and finally from November to December the weather is much colder and dry.

3.4 Social events and festivals

Table 4. Social events and festivals mentioned by group

Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Better off mens	Lunar Tet holiday festival 15/1							Festival wedding season, children's holiday	16/8. Tet			
Worse-off mens	Festival							Festival	Wedding season from September to January next year			
Worse-off womens	15/1 festival 6/2 Congratulation on longevity, wedding		Floating cake ceremony				15/7 Clean and forgiveness festival	16/8 Festival	Wedding season, 10/10 new rice crop			
Better-off womens	15/1 festival 6/2 Congratulation on longevity, wedding							Festival	Wedding season			

Similar to other local villages, Bang B has customs. All groups mentioned Lunar Tet holiday on the first day of January, festival on 15-16th January and on 16th August. The Wedding Season extends from November into the New Year.

Festival of congratulation on (age) longevity was mentioned on 6th February by both the rich and worse-off women's groups. The worse-off women's group also mentioned floating cake day in March and new rice day in October.

3.5 Status of migration by seasons

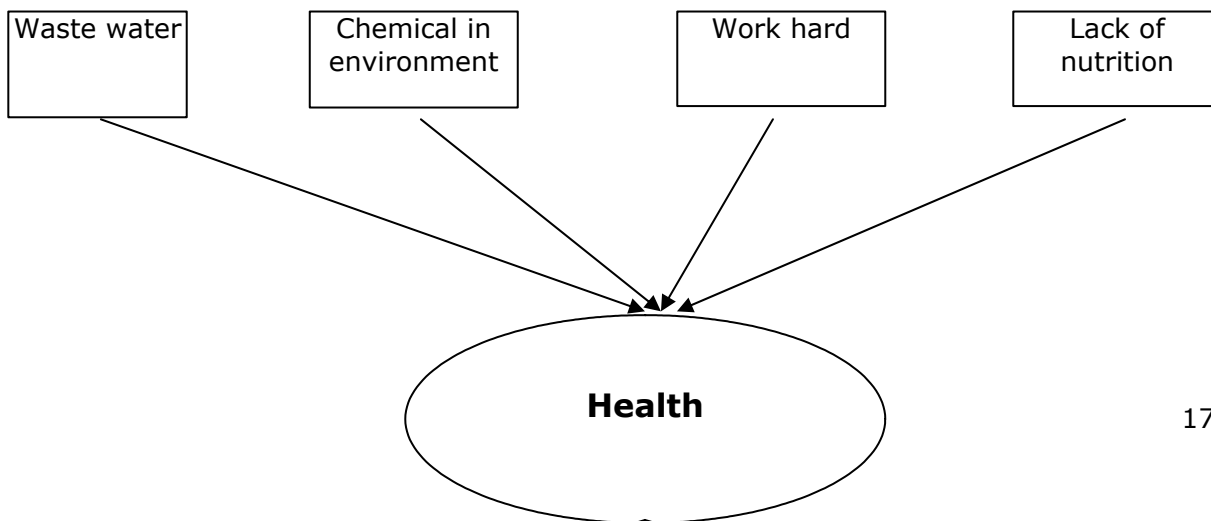
Following the crop season, inhabitants of Bang B are not only involved in planting rice, vegetables, and carrying out fish culture but also other work in the village, therefore it is unusual for people to go looking for work in the city centre. However, some people help their relatives to build houses and do woodwork in their leisure time. Migration of people and labors was mentioned from the village by the better-off mens, worse-off mens and better-off women's groups so it is obviously occurring from the village at certain times of the year.

3.6 Status of health problems

Table 5. Health problems mentioned by groups

Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Better-off mens			Sore eyes			Fever		Flu, sore throat				
Worse-off mens	Back ache		Skin disease						Fever, back ache			
Worse-off womens					Flu, fever			Sore throat				
Better-off womens			Diarrhea, Skin swelling				Flu, Sore throat					

Due to the colder weather occurring from November to February back-ache and rheumatism occur according to the worse-off men's group. Skin diseases such as ulcerations occur on people who are working in a polluted water environment. These diseases often occur between March to July (worse-off mens, better-off womens mentioned). Better-off men's group mentioned getting sore eyes in March and April. Other diseases such as: Fever, flu, sore throat were also mentioned by 4 groups from May to October. However, diarrhea was only mentioned by the better-off women's group.



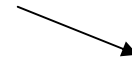


Figure 7. Health Issues in Bang B village.

3.7. Incomes relating to the seasons

People in Bang B are not only doing agriculture but also other work, so their income is very much dependant on the seasons: In April and August they harvest spring and winter rice respectively. Meanwhile, in June and October they harvest their fish.

Unlike fish culture, those with livestock usually sell pigs in April, July and November. Other livestock are harvested throughout the year.

In addition, income from other jobs such as: Inox metal also supplements peoples' incomes during the year.

Peoples expenditure is normally spread throughout the year however it usually increases significantly during the wedding season from November through to the following February.

3.8 Production

All groups mentioned their rice cultivation. There are two rice crops they produced per year. Water morning glory cultivation is mentioned and harvested throughout the year. Kohlrabi, cabbage, mustard and tomato were planted, maintained and harvested in the late or early months of year between November – February. The mens groups in Hoang Liet identified fish culture. Fish culture practices are different amongst the mens groups. The better-off mens group start stocking fingerlings/small fish in March and April each year, on-grow them for 6 months and then harvest

in November but the worse-off mens group stock and harvest every 2 to 3 months throughout year. Regarding aquatic plant culture, Water dropwort and Watercress were mentioned by groups in Hoang Liet and they produce in the winter season from November to February.

3.9. Consumption

Table 6. Food consumption mentioned by better-off men's group

Food/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Self-Production	Rice											
	Water morning glory											
	Water dropwort							Water dropwort				
			Neptunia									
	Other vegetables								Other vegetables			
	Fish, chicken, duck								Fish, chicken, duck			
Bought	Pork, shrimp, fish...							Pork, shrimp, fish				
	Sugar, milk, tofu, salt, fish sauce											
Self-sufficient			Crab, snails									

Table 7 Food consumption mentioned by worse-off means group

Food/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Self-production	Rice, water morning glory											

		Mustard greens, amaranth, basella alba										
				Water dropwort				Neptunia				
	Watercress							Watercress				
				Fish					Fish			Fish
Bought	Pork, eggs, sugar, milk, beer, wines											
	Fish				Fish					Fish		
	Orange, mandarin									Orange, mandarin		
				Longan, lychee, water melon, mango								
Self-sufficient	None											

Table 8 Food consumption mentioned by worse-off womens group

Food/month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Self-production	Water morning glory, water dropwort, watercress		Water neptunia		morning glory,		Kohlrabi, water dropwort, watercress					
Bought	Beef, chicken meat, pork, duck meat... Fish, shrimp, crab Tofu, pork pie, fish sauce, salt											
Self-sufficient	None											

Table 9. Food consumption mentioned by better-off womens group

Food/month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Self-production		Water morning glory, mustard greens, malabar nightshade										
	Mustard greens				Neptunia					Water dropwort		
Bought	Pork, chicken meat, eggs, tofu											
										Fish and beef		
				Sugar, milk, fruits								
Self-sufficient	None											

Food-production:

- Rice is consumed throughout the year (2 mens group mentioned)
- Vegetables: Neptunia is consumed from April to September, water dropwort is consumed from August to February the following year. Water morning glory is consumed almost the whole year except the 3 months of November, December and January (4 groups mentioned).
- Fish is consumed from January to April and August to November (2 mens groups mentioned)

Bought:

- All groups bought and consumed foods such as: Sugar, milk, tofu, salt, fish sauce during the year. Besides the 2 men groups discussed that they consumed pork, fish, shrimp in January to April and from August to December. However fruits are consumed from April to September (poor men mentioned) and beef and fish consumed much more from September to December (rich womens group mentioned).

Self-sufficient:

- Almost all groups practice some form of producing their own food whilst also buying some foods from the market. The rich mens group mentioned that they can catch crabs and snails from March to September and Centella from January to October.

3.10. Activities

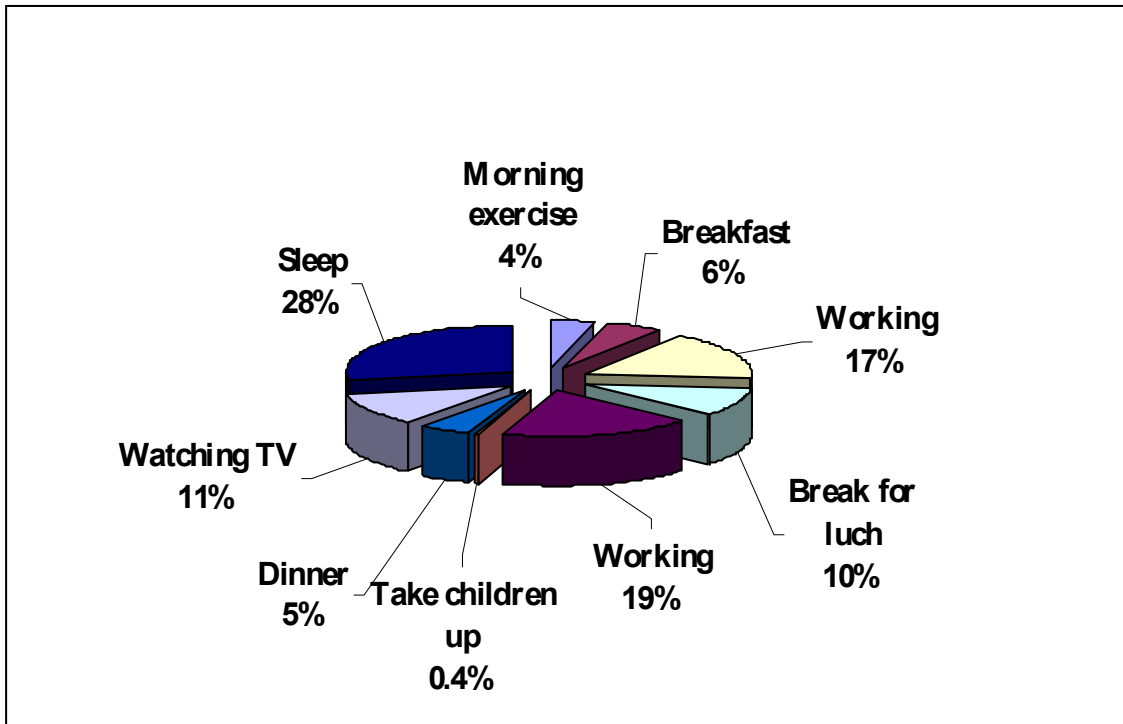


Figure 8 Daily activities of better off mens group

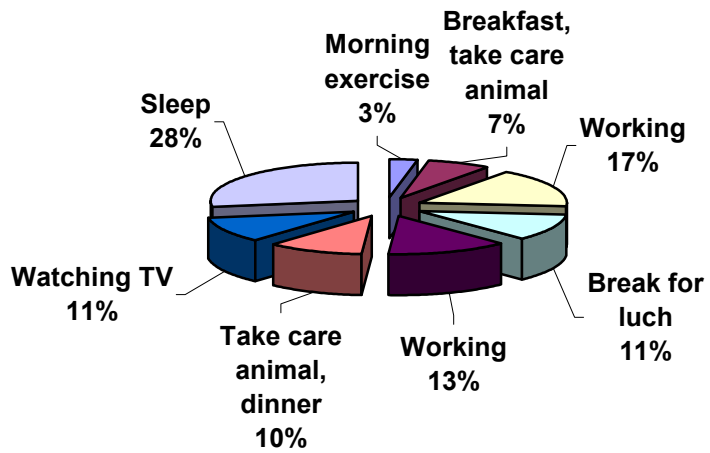


Figure 9 Daily activities of Poorer Mens Group

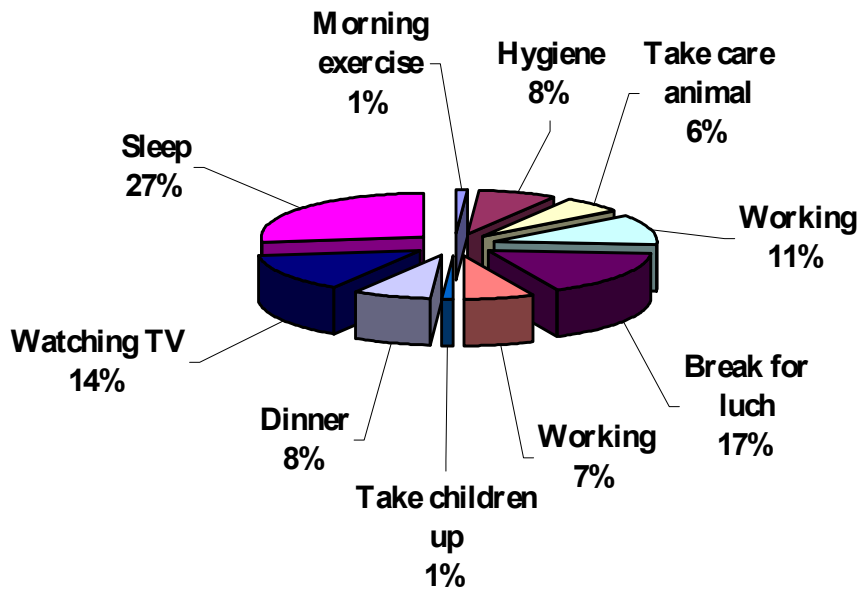


Figure 10 Daily activities of Better of womens group

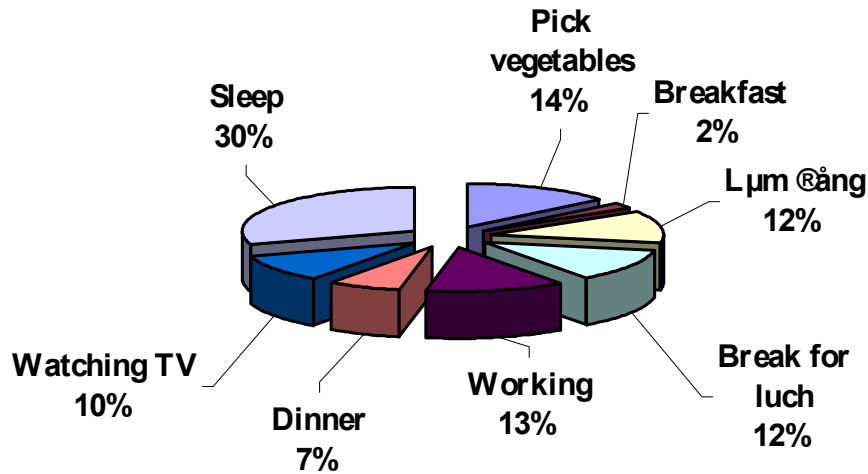
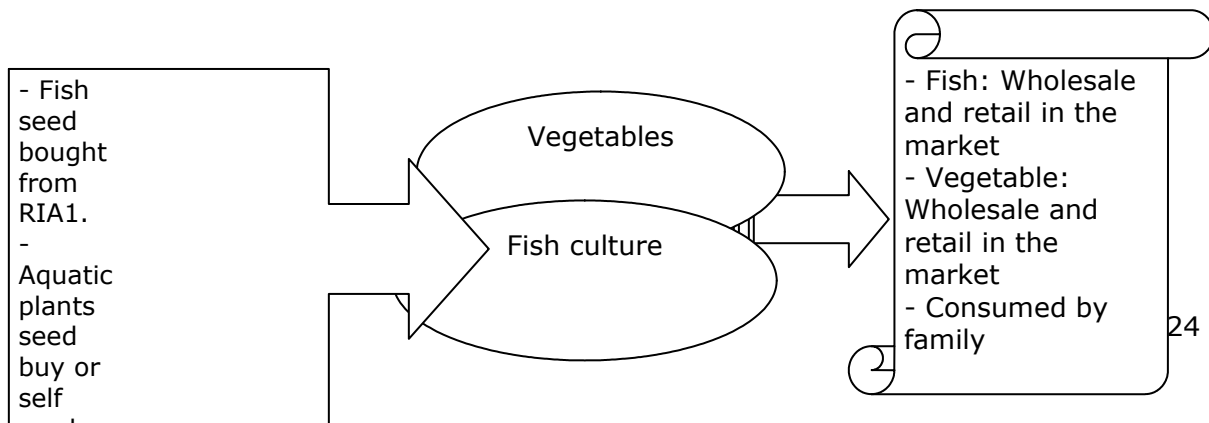


Figure 11 Daily activities of Poor women's group

In general, the activities of the 2 men groups are not much different such as: Working in the morning, watching television, and sleeping occupied 17%, 11% and 28% respectively of their time. However, the worse-off mens group spent 0.4% duration of day for taking children home.

There were some differences between the better off and poor womens groups in how they spent their days. Generally better off women had more varied activities during their days, but the poorer women spent much more time daily (39%) in work/productive activities compared to 19% for better off women.

3.11. Resources



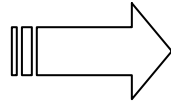


Figure 12. Resource mapping drawn by better-off mens group

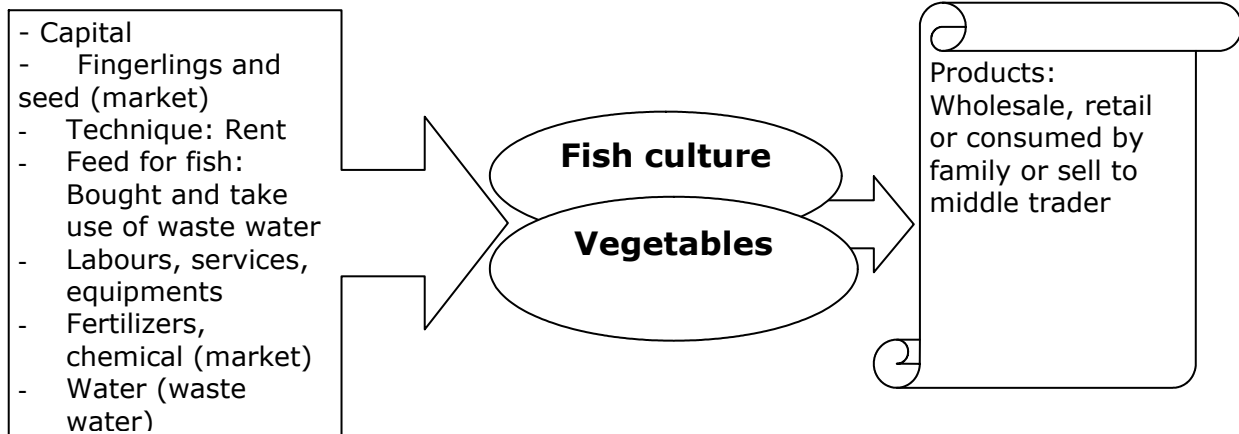


Figure 13 Resource mapping drawn by worse-off mens group

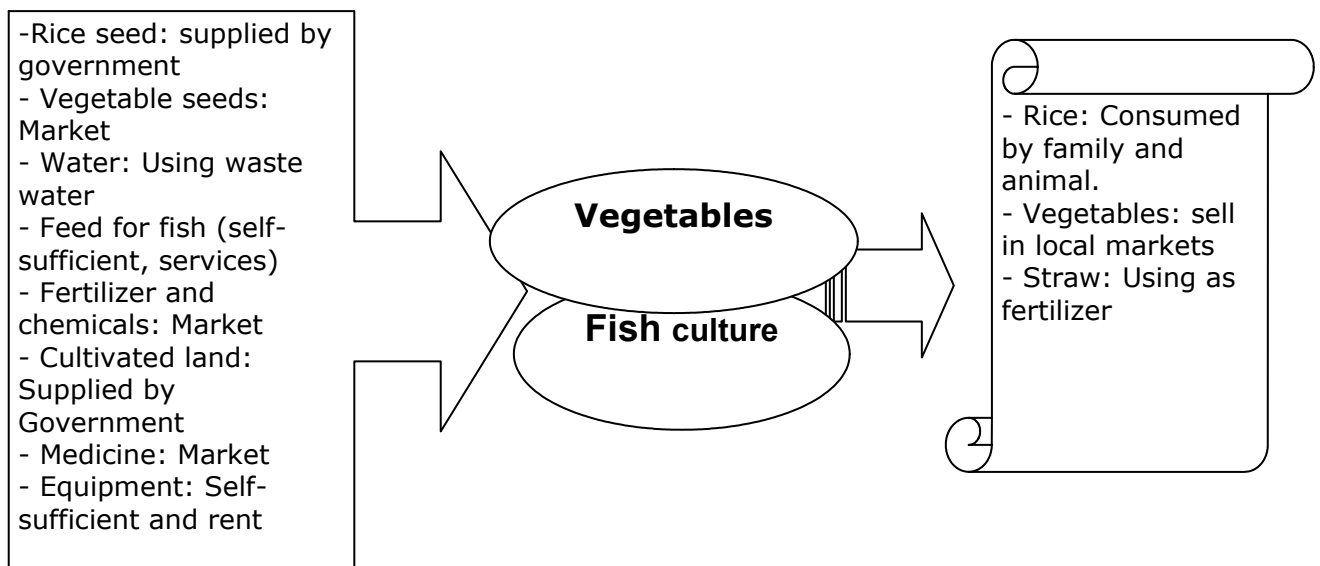


Figure 14 Resource mapping drawn by better-off womens group

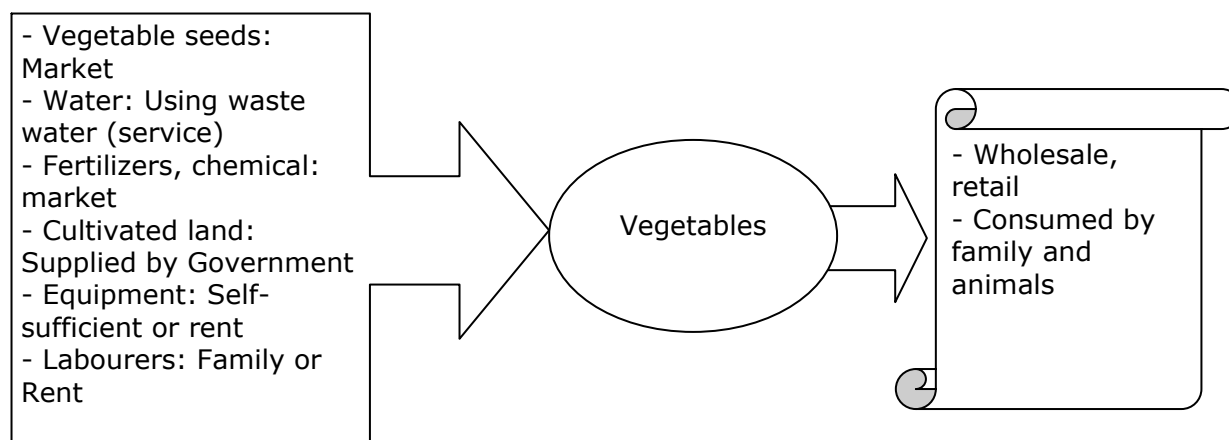


Figure 15. Resource mapping drawn by worse-off womens group

Water source: Using waste water from To Lich river.

Fertilizers: Using animal manures eg pig, chicken, buffalo, cow for both land vegetable and aquatic plants, or fish culture.

Labour: Due to business and production commitments people in Bang B are busy, therefore it is normally only family labour which is used for production systems.

Outputs:

Generally the products from fish and aquatic plant culture are wholesaled and retailed on the dike eg by the side of the farmers pond. A small amount are either sold to local markets or consumed at home by the family. They usually sell their products to markets on the outskirts of the city such as: Mo Market, Hom Market, Long Bien Market.

3.12. Other information

There are the other economic activities:

Table 10 Annual Activities in agriculture of Better off mens group.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-Rice	Transplant		Take care		Harvest		Transplant, take care and harvest					
- Neptunia		Plants		Harvest		Plant		Harvest				
-Water dropwort								Plant		Harvest		

-Water morning glory	Plant and harvest							
- Livestock	Poultry, cattle and harvest							
-Services-trade	Small Business							
Input/output	Seeds			Harvest			Harvest animals, vegetables	
Inox, metalwork, services	All year							

Table 11. Annual agricultural activities of poorer mens group

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice		1st crop				2nd crop						
Neptunia			Harvest									
-Water dropwort	Plant		Harvest				Plant		Harvest			
- Water morning glory	All year											
- Fish culture	Harvested in 3, 6 and 9th months											

Table 12. Annual agricultural activities for Poor womens group

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice	Plant and take care				Harvest	Plant, take care and harvest						

Vegetables	Water dropwort, water morning glory	Neptunia, water morning glory	Water dropwort, water cress
Livestock	Livestock		
Input/output	Higher expenditure on inputs in January and February, and from August to December		

Table 13 Annual agricultural activities for better off womens group

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice	Plant		Take care and harvest			Plant and harvest						
- Neptunia	Plant and harvest											
- Water dropwort	Plant and harvest											
- Water morning glory	Plant and harvest											
- Livestock						From June to December						
Investment/harvest	Harvest		Investment			Harvest		Investment				

Livestock:

Due to the diversified availability of natural foods such as vegetables, rice, animals are raised throughout the year .

Fish culture: Fish farmers usually harvest several times per year, often in March, June, August or September. They use the waste water of the City, exchanging or pumping waste water once a week. This pumping of waste water is collectively paid by the farmers who use it.

Aquatic Vegetables: In general, all groups agreed that aquatic vegetables were cultured throughout the whole year. These include water dropwort, neptunia, water morning glory, and water cress. Water dropwort is planted from October to March the following next year, with the main harvests being from September to December. Water morning glory is harvested from February to September and Neptunia from April to July.

Rice: According to all of the groups there are 2 crops of rice per year: The spring crop is from January to mid-May and the winter crop from June to October.

Industrial handicrafts Inox – coated metalwork, paint plate, production of hygiene paper and other services.

3.13. Problems

Problems relating to health

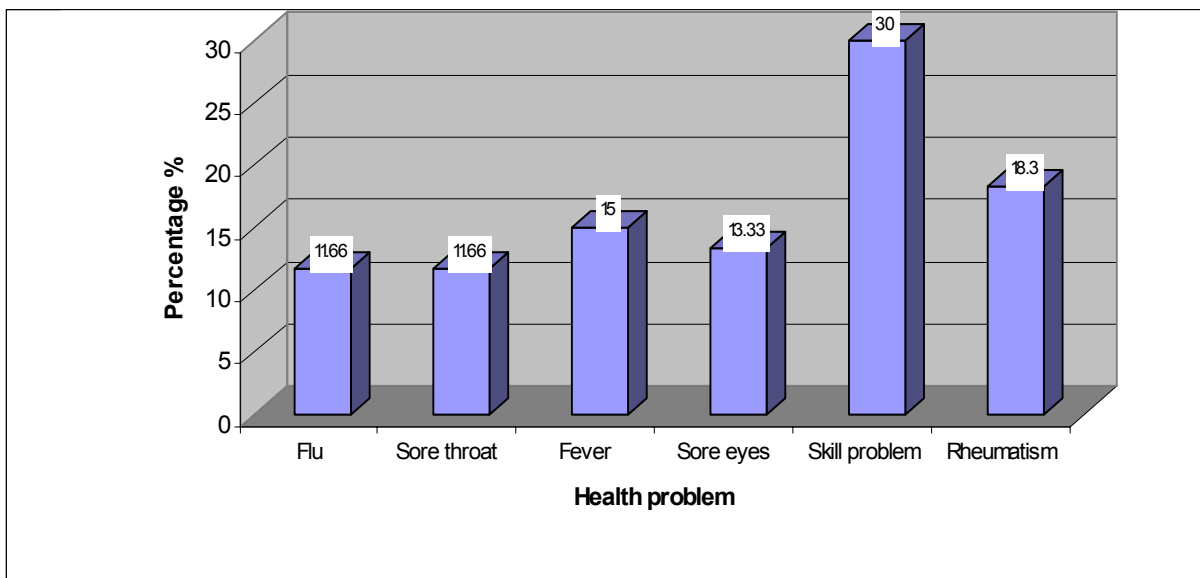
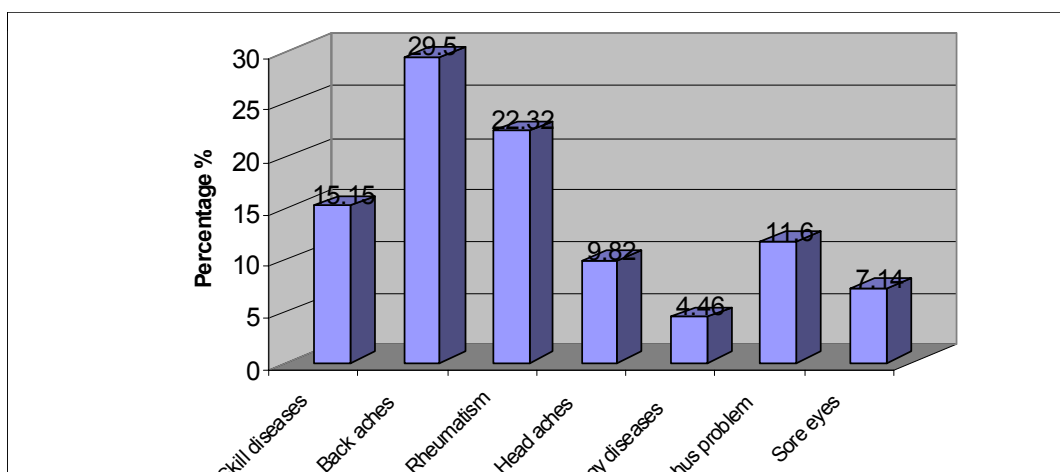


Figure 16: Health problems mentioned by better-off mens group



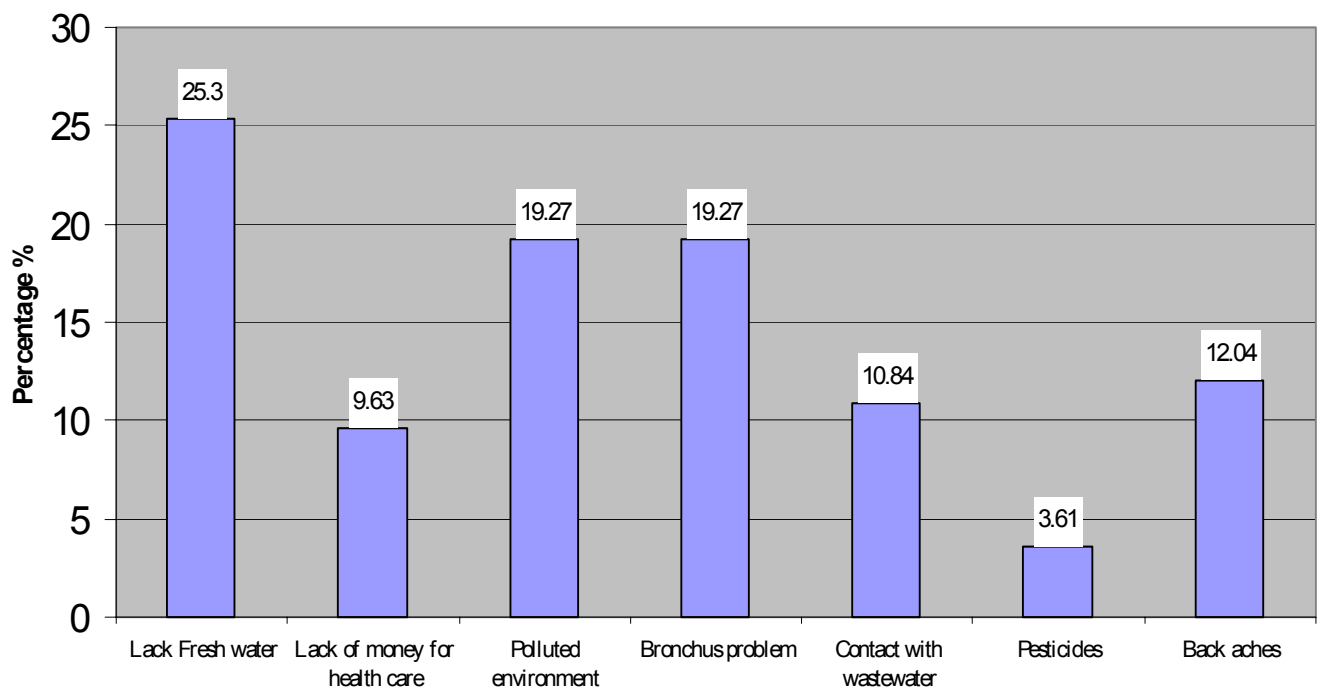


Figure 17: Health problem mentioned by worse-off mens group

Figure 18: Health problems mentioned by Worse-off womens group

Figure 19. Health problems mentioned by Better-off womens group

The better off mens and worse-off womens groups mentioned health problems such as skin diseases, back-aches, and rheumatism. Whilst gynaecological problems were mentioned specifically by both of the womens groups. Headaches, sore eyes, respiratory problems and the adverse effects of pesticides on health were mentioned by almost all the groups.

Problems of Aquatic plant growers and fish farmers

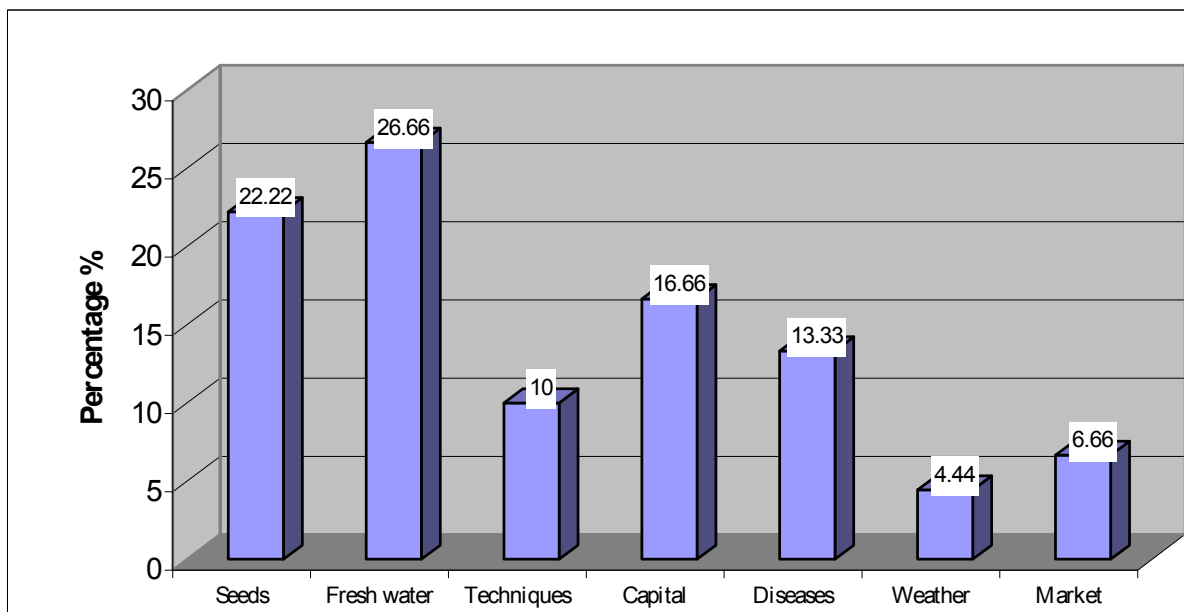
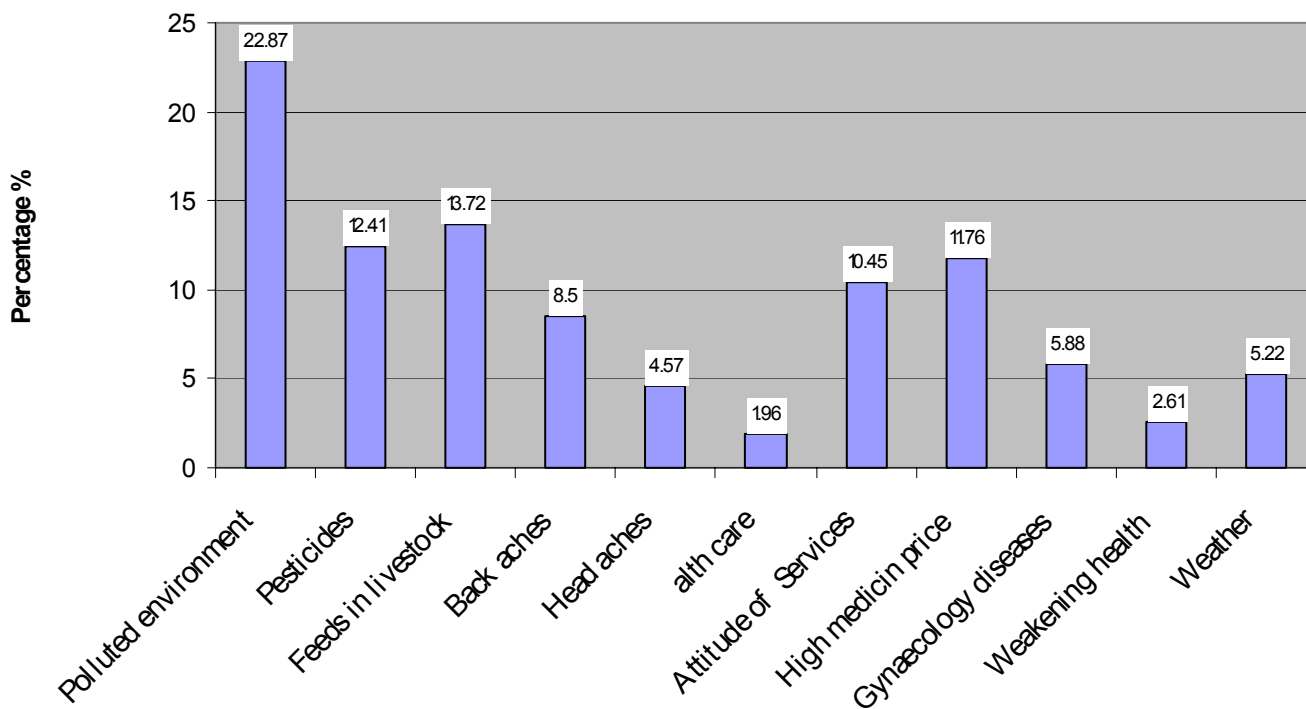


Figure 20 Main problems mentioned by Better off mens group



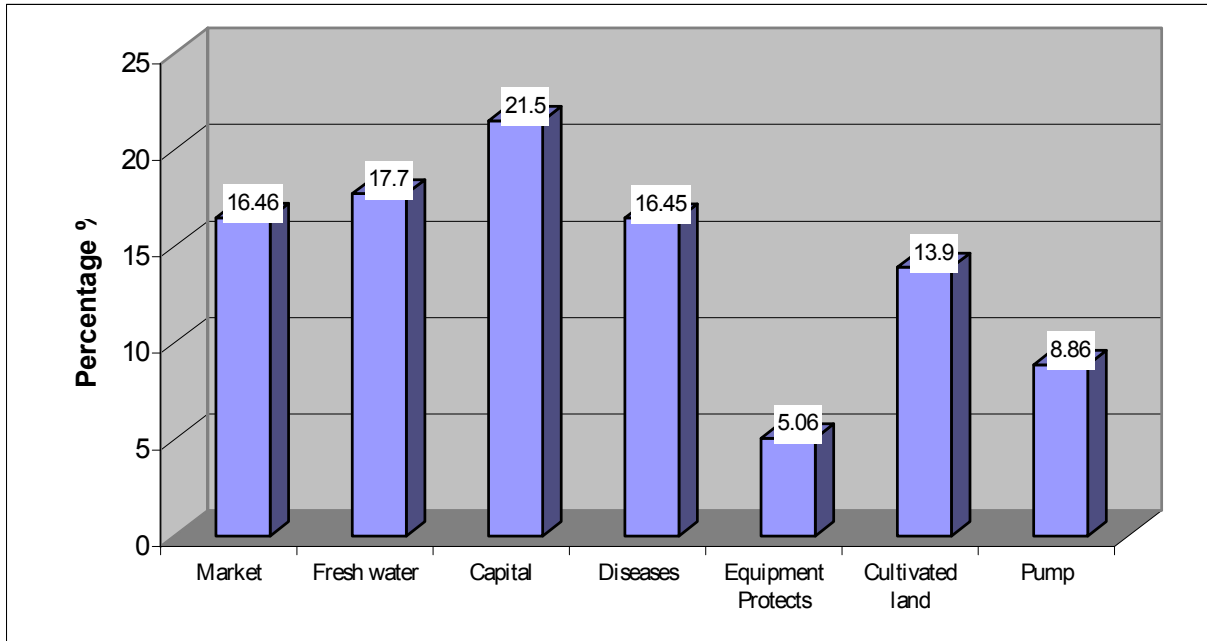


Figure 21: Main problems mentioned by worse-off mens group

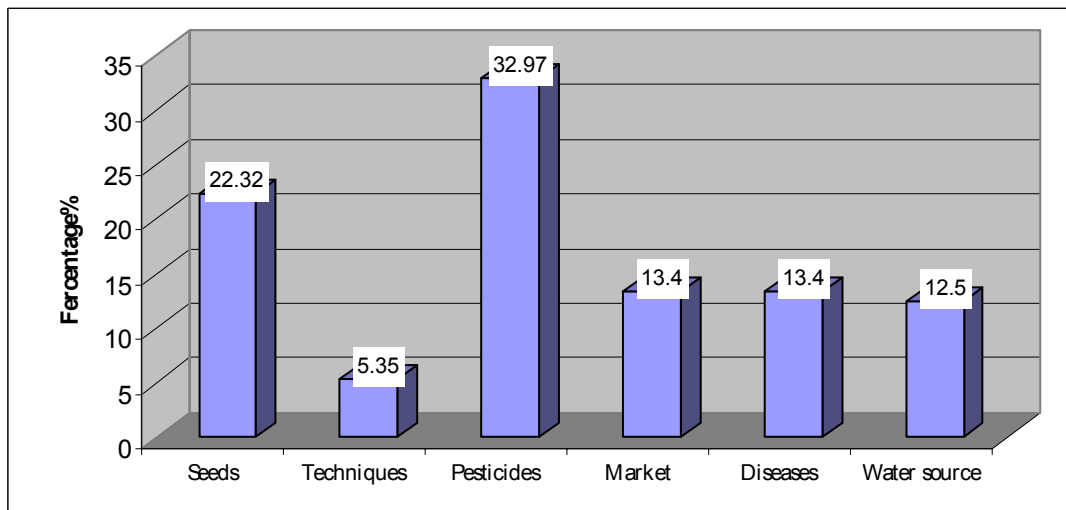


Figure 22: Main problem mentioned by worse-off womens group

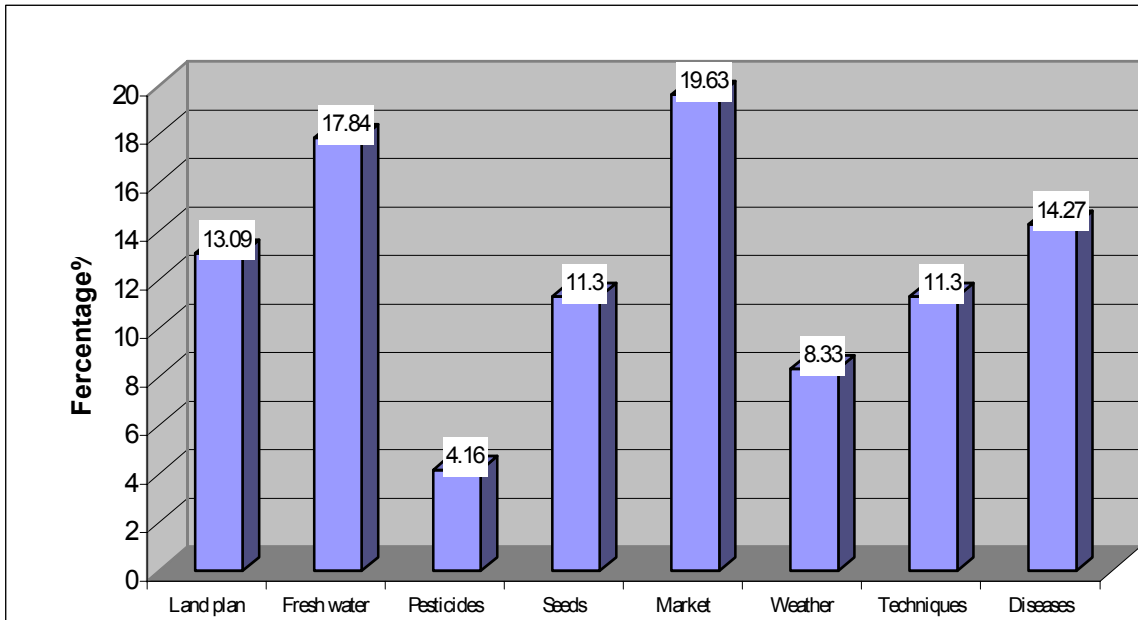


Figure 23: Main problems mentioned by Better off womens group

The commonest difficulty of all 4 groups was the lack of fresh water (due to using waste water), but presented levels are different in 4 groups. The next most important difficulties were marketing and diseases of fish and aquatic plants. Vegetable prices are unstable depending on season. Mid season vegetable price is cheaper than the beginning and end of the season. Therefore benefit from vegetable planting is not high. Level of fish and aquatic plants diseases of each group was difficult with 16.45% of poor men and 14.27% of rich women, and the rich mens and poor women's groups were occupied 12.27% and 13.4 %. The poor mens group especially mentioned lack of capital (21.5% compared with 16.65% of the richer mens group). Almost all groups discussed that they lack technical knowledge on fish culture as well as aquatic plants seeds getting problems, except the poor mens group who did not mention it.

In addition, difficulties such as: using Pesticides, water pumping, safety equipment, and and weather were discussed in workshop.

3.14 Feedback to commune

Following analysis and collation of the findings from the PCA the research group returned to Bang B village on 26th November and the morning of the 3rd November to present the feedback

of these results of their analysis to the participants. The following supplementary information was also gathered:

Village map: limits of village

- East-North: Linh Dam lake
- Right under corner: Tam Hiep commune
- Right over corner: East
- Left under corner: West

Village history

- 1959: Establish of Co-operation (49 households)
- 1960: Establish of high level of Co-operation
- 1980: United Co-operation
- 1991: Hire 10 government law introduced.

Seasonal calendar

- Mustard greens produced from August to December
- Price of vegetables: Cheap price from April to May
- Expenditure: Much more spent at the end of July for children to go to school

Foods

- Rice: Self-sufficient, but pork and fish are bought all year.

Problems in fish culture and vegetable plants

- Seeds and marketing

Problems in health

- Common diseases such as: Backaches, skin diseases, sore eyes

Resources map

Input: Seeds: self -sufficient and bought.

Wastewater, pesticide, chemical, fertilizers were bought from market and locally.

Farmers do not use night-soil for either land or aquatic vegetables

Output: Products for wholesale and retail. Besides, they were consumed by family and for animals.

Aquatic plants are more important than fish culture in term of income activities in the village.

V. Conclusions and recommendations

4.1. Conclusions

- The main jobs the participants of the PCA of Bang B are in agriculture but they are also involved with other jobs such as: Inox, metal. Almost all of the farmers here work from 10 to 12 hours per day.
- Their living standard is better than in the past, but their knowledge on new techniques for aquatic plant and fish culture are limited, which has an effect on the potential for increasing their production.
- Due to progressive urbanization and development of former cultivated land in Bang B there is increasingly less land available for fish culture. In addition the present time period of land rental/ownership contracts for fish culture is short about 5 years therefore fish farmers are not confident in investing further money into developing their systems and production.

4.2. Recommendations

- Need for specific plan for agricultural development for Bang B from year 2010 to 2020
- Require better transfer of new techniques on aquaculture and agriculture to farmers.
- Would like trials for some new culture systems/models for new species of fish and fresh vegetables which can be used locally.
- To organize sightseeing and study visits (local tourism) to local farmers who have high productivity in fish culture and aquatic plant cultivation.

INDEX

Index 1: Wealth being ranking

No.	Name	Time 1 (3)	Time 2 (4)	Time 3 (2)	Notes
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1	Bui Xuan Tuan	1	3	2	Aquatic Veg.
2	Luu Bach Tinh	1	2	1	Aquatic Veg.
3	Nguyen Hong Hai	1	2	1	Aquatic Veg.
4	Luu Thi Cai	1	2	2	Aquatic Veg.
5	Luu Thi Diem	1	3	1	Aquatic Veg.
6	Luu Thi Minh (Hanh)	1	1	2	Aquatic Veg.
7	Nguyen Minh Chinh	1	1	1	Aquatic Veg.
8	Nguyen Hung Cuong	1	3	1	Aquatic Veg.
9	Luu Thi Ngoc Thu (Thuy)	1	2	1	Aquatic Veg.
10	Nguyen Thi Bich	1	2	1	Aquatic Veg.
11	Luu Bach Vuong	1	1	1	Aquatic Veg.
12	Nguyen Dinh An (Dung)	1	2	1	Aquatic Veg.
13	Nguyen Dinh Tai	2	2	2	Aquatic Veg.
14	Nguyen Thi Nhuan (May Quyet)	2	4	2	Aquatic Veg.
15	Nguyen Hoang Dieu (Bao)	1	2	2	Aquatic Veg.
16	Nguyen Son Tham	3	4	2	Fish pond
17	Nguyen Dinh Tat (Oanh)	3	4	2	Fish pond
18	Luu Bach Bay	1	3	2	Fish pond
19	Nguyen Quang Son	2	1	2	Fish pond
20	Mai Van Quy	2	4	2	Fish pond
21	Thuat Hai	3	3	2	Raise pig
22	Nguyen Thi Long (Ngan)	3	4	2	Raise pig
23	Hung Bang	1	4	2	Raise pig
24	Hung Chinh	2	4	2	Raise pig
25	Nguyen Thi Thanh	1	3	2	Rice plant
26	Nguyen Thi That	1	3	2	Rice plant
27	Mai Thi Thao	2	3	2	Rice plant
28	Nguyen Trong Thua	1	1	1	Rice plant
29	Luu Thi Sen	3	4	2	Mechanical
30	Luu Thi Tam	3	3	2	Sub-job
31	Nguyen Van Phuong	3	4	2	Carpentry
32	Luu Bach Nhan	2	4	1	Carpentry

33	Phung Van Loi	3			Tu Ky fish culture
34	Phung Van Chien	2			Tu Ky fish
35	Tran Ngoc Gang	3			Linh Dam fish culture
36	Tuong Duy Vuong	2			Phap van fish

Index 2: 4 groups

No.	Group 1 (Worse-off womens)	No.	Group 2 (Worse-off mens)
1	Nguyen Hong Hai	1	Luu Bach Tinh Dong
2	Luu Thi Cai	2	Nguyen Hung Cuong
3	Luu Thi Diem	3	Luu Bach Vuong
4	Luu Minh Hanh (wife)	4	Nguyen Sinh An Dung
5	Nguyen Dinh Chinh (wife)	5	Nguyen Hoang Dien Bao
6	Luu Ngoc Thu Thuy	6	Nguyen Quang Son
7	Nguyen Thi Quang Bich	7	Nguyen Trong Thua
8	Nguyen Thi That	8	Luu Bach Nhan
No.	Group 3 (Better off womens)	No.	Group 4 (Better off mens)
1	Nguyen Thi Nhuan	1	Bui Xuan Tuan
2	Nguyen Thi Long Ngan	2	Nguyen Dinh Tai
3	Hung Bang	3	Nguyen Son Tham
4	Hung Chinh (Thu)	4	Luu Bich Lua (Head of village)
5	Nguyen Thi Thanh	5	Mai Van Quy
6	Mai Thi Thao	6	Thuat Hai
7	Luu Thi Sen	7	Nguyen Van Phuong
8	Luu Thi Tam	8	Nguyen Dinh Tat (Oanh)