

**Self-Recruiting Species in Aquaculture:  
Their Role in Rural Livelihoods**

**Participatory Rural Appraisal in Ban Kudload  
Case Study 6  
(PRA Report from 2001)**

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## Ban Kudlod Village

### Introduction

#### *Background*

The status of aquatic systems in this province particularly in this village has not been established. To an outsider, knowing the general background of the village is very important. The information to be gathered can be used to design new programs or other development interventions in the area. It is also essential that the information is generated from and with the primary stakeholders themselves - the farmers/villagers.

#### *Objectives*

The main objectives of the study are to have a clear picture of the livelihood activities in the village as a whole and to establish rapport with the villagers. To attain these objectives, the following are the specific objectives:

1. To assess the local conditions in the village;
2. To gather baseline information on the status of aquatic animals in the area;
3. To work with the villagers in facilitating the identification of issues in the community.

#### *Participatory Rural Appraisal Team*

Mr. Chainarong Cheunchom	Biologist,DOF-Roi-et
Mr. Sittipol Laosingla	AOP-RA
Mr. Thawatchai Viriyaphap	AOP-RA
Mr. Prasit Dayounggram	AOP-Field Technician

#### *Schedule of Activities*

The whole activity including gathering of secondary data was done in five days. During this period, data from other villages were also collected. Like the other PRA activities, the area was visited first for ocular inspection to see the topography and distance from the perennial water bodies.

The second day was spent for introduction to the villages. On this day the team was able to generate information about the village and its history. Participants for the next day activity were also identified during this period. The rest of the schedule was devoted to generating more information about the different activities in the village. The last day of the workshop was used for presentation of the results from the three days exercises.

**Table 1 Schedule of Activities during the PRA in Kudloa village**

<b>Date</b>	<b>Activities</b>
28 May 2001	Collection of secondary data
29 May 2001	Introduction of project with the village head Village profile Identification of PRA participants
30 May 2001	PRA exercises (Rich group)
31 May 2001	PRA exercises (Poor group)
01 June 2001	Processing of PRA outputs Presentation of PRA outputs

**Roi-et Province****Description**

Location and boundaries:

The province is located on the north east of Thailand.

Altitude 15° 17' - 16° 19' North longitude 103° 17' - 104° 22' east

516 km away from Bangkok

North boundaries - Kalasin and Mukdahan

South boundaries - Surin and Srisaket province

East boundary - Yasothon province

West boundary - Mahasarakham province

**Administration**

Number of districts: 17 with 3 branch district

Population : 1,321,035

**Main occupation**

Rice cultivation, Tungkalarong hai, the best quality of rice in Thailand

Other crops: Cassava, kenaf, sugarcane, soybean.

Other source of income: silk

**Topography**

Generally flat with slight slope from northern and southern to some part towards the east

Total area : 8299.46 km<sup>2</sup>

**Water bodies:**

The important water bodies are mostly coming from the mountain. Flowing to Chi river, Yang river, Moon river Suiy stream, Plabpla and Toa streams

**Rain fall**

An average of 1258.1 mm/year or 105 days rainfall per year

**Phanomprai District****Location**

Located south of Roi-et province.

Distance from the province proper: 64 km away

*Kudload village*

**Boundaries:**

- Northern boundary: Muang district of Yasothon
- Southern boundary: Ponchai district of Roi-et province and Rasisarai district of Srisaket.
- Eastern boundary : Kamkuankeaw and Mahachanachai district
- Western boundary : Nonghee Adsamart suwanaphum

**Topography:**

Generally the district is plain including the ricefields but have some area of forest.

Total area: 458.08 km<sup>2</sup>

Land for Agriculture: 25459.2 hectares

**Administrative:**

- 13 sub districts
- 160 villages
- 15569 households

Total population : 78443 individual

Water resources: Chi river, Gakwak stream

Main occupation : rice cultivation

Secondary occupation: Wage labour, merchant and fishery.

Main crop: Rice

**Kudload Village**

Total household number: 99

Total population : 482

Main occupation: Rice farming (extensively using agrochemicals that is believed to be affecting fish health)

Migration : Most young people moved to Bangkok for work. Head of household usually work outside the village but not for long time.

Topography: Generally the area is plain with loamy type of soil. The village is situated 10 km away from Chi river and 5 km away from the district proper.

Water resources: Kagwak stream (500 meter far from the village); public ponds (originally swampy area) Nongyai and Nong Bungkea

**Selection Process for the Village**

The village was selected after visiting the district office and assessing the information given about the area. Aside from introducing the team to the commune/district office, a brief interview was done with the officers in the station. The interview focused on the general information about the area, topography, agriculture situation and aquatic resources. Afterwards the group selected the village

*Kudload village*

and visited the place for clearing and to be introduced to the area. The bases for selection were the following: the village represents a backward village, the number of households, its distance from the river and the abundance of water resources.

### **Specific Methods Used**

*Village (Resource) Map* - Mapping of the resources was conducted to generate information about the different resources present in the village and how these resources impact the villagers.

*Timeline* - This was done to trace the development trends in the village. This activity also showed the different "shocks" the village encountered from past to present.

*Well-being Ranking*. Mapping of the socio-economic context of the village was done. This activity determined the different social groupings in the village and how villagers naturally grouped themselves.

*Seasonal calendar*. This illustrated the different situations in the village during the year. Information about the weather, traditions and festivals, economic activities, when people migrate and the health conditions were included in the calendar.

*Activity profile*. This activity identified the common activities in the village and differentiated the priorities of each group.

*Aquatic animals identification/ranking*. This was accomplished to determine the available and unavailable aquatic species in the area. This activity also established the importance to the villagers of each aquatic animal.

*Aquatic animals' seasonality*. This activity showed the status of each aquatic animal during the year. The location where aquatic animals can be caught and the gear that can be used were also included in the seasonality diagram.

*Aquatic animals' trend*. This activity showed the perceptions of the different groups on the status and condition of the different aquatic animals in the village. The causes of the increase as well as the decrease of a particular aquatic animal were also analysed.

*Transect*. Established "ground truths" to cross check the map.

### **Process**

The workshop was divided into three parts. The first part was done with the key informants on the first day. The mapping (village map) exercise was done with a group of key informants in the village headed by the village headman. The list of all households in the village was obtained from the village headman. This was used in the well being ranking activity. Names were written down in cards and farmers or informants grouped the different names according to what they thought was the well being of the farmer/villager.

*Kudload village*

Using the results of the well being ranking, participants for next day's activity were identified. Representatives from the poor and rich groups were listed down. A total of four groups were identified: two groups representing the poor men and women, and another two groups of rich men and women.

The group of better-off households were invited first and did the exercises and generated a lot of good information. On the following day the group of poor households were then invited and did the same activities that the rich group conducted the other day.

From each group the team separated the men and women and asked each group to do the same activities. At the end of the exercises, facilitators compared the results from the different groups. All the outputs from the first to the third day activities were then collated and summarised by the team. On the last day of the visit, the outputs were presented and validated with the villagers.

### **Setting the Context**

#### **Mapping the Current Resource Context**

Generally the village is plain with loamy type of soil. The village is situated 10 km from Chi river. A large part of the village is used for rice cultivation. Most of the houses are concentrated in the middle of the village while the rice fields surround the village. Aside from rice, gardening or growing crops is another use for land in the area.

Water is not a limited resource in this area although in summer, some water resources dry up. The main water resource in the village is the "Kamwak" stream, which almost surrounds and isolates the village from other villages. Public pond, household ponds and trap ponds are some of the water resources that villagers also benefit from.

Physical resources are also available in the village. A school was established in the village so children can have good education. Places where farmers can get their inputs for farming are also available. Other services like communication and transport are no longer a problem in this village.

#### **Mapping the Development Context**

The development of this village is presented in Figure 2. Villagers were able to recall events that happened in the village from 1957. During this period the condition of the environment or the resources were no longer good. The development started that early in this village.

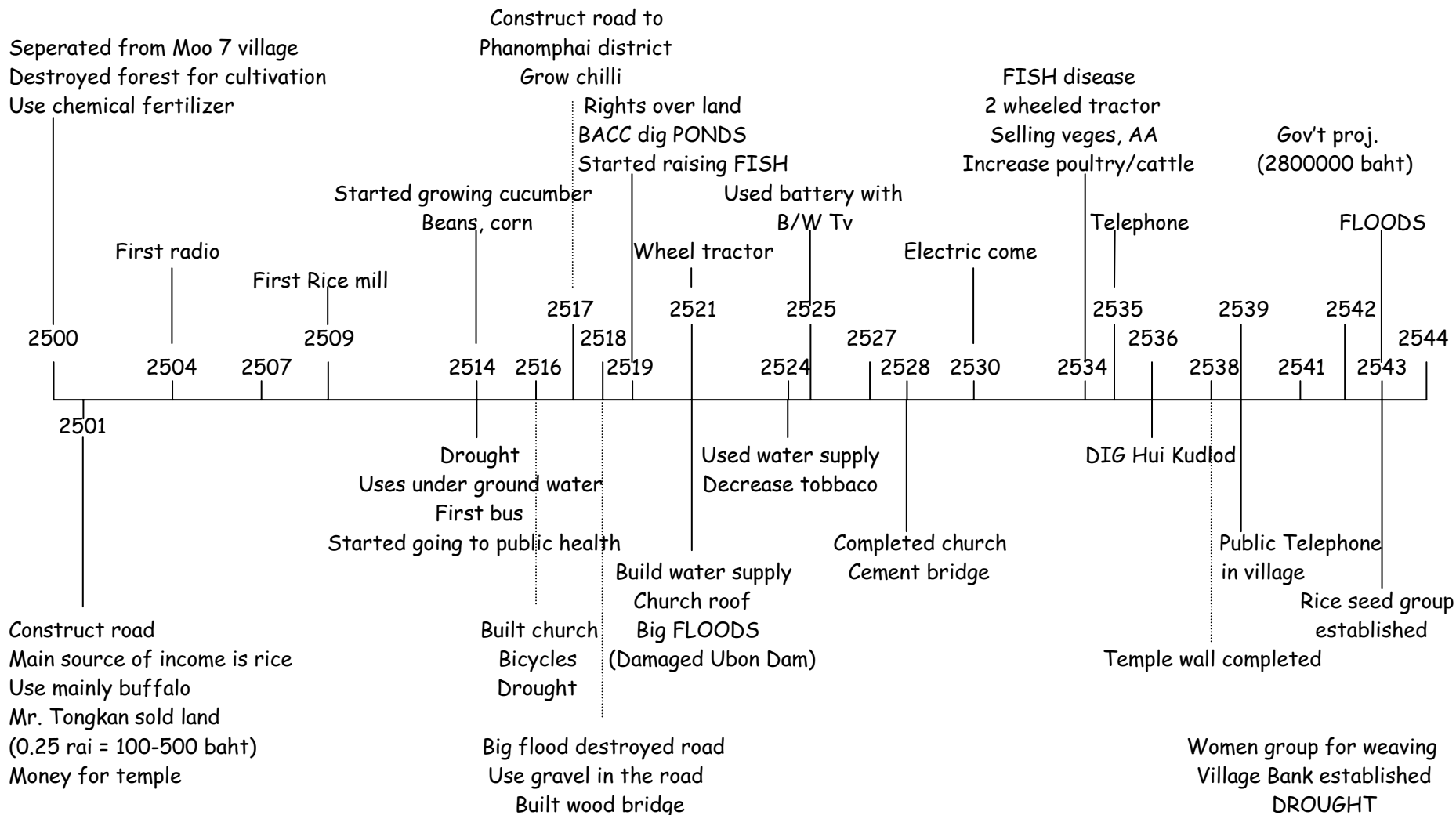
Mapping the Current Resource Context

Figure 1 Village Map of Ban Kudlod



Kudlod village

**Mapping the Development of the village (Timeline)**



**Figure 2** Historial Development of Ban Kudlod



***Additional Notes for Timeline:***

- 2492 - Villagers started migrating to other province for work  
Doctor was visiting the village
- 2494 - Introduction of first bicycle
- 2496 - Had school in the temple
- 2498 - Titles for land was given
- 2499 - Primary school separated from the temple

Participants in the exercise:

Mr. Prajuab  
Mr. Somkuan  
Mr. Toe  
Mrs. Samneiang  
Mrs. Sutat  
Mrs. Prani

Physical development in the village started in 1957 (2501) when the road was constructed. After this event, more development happened in the village like the introduction of modern appliances, and establishment of a rice mill in 1966. In 1971 the transport system improved through the introduction of the first bus into the village. Other infrastructure established were churches, temples, bridge and other services, a few years after the introduction of good transport. The installation of electric and telephone services only happened in 1987.

Agriculture already begun to develop in this area even while the village was just starting. Chemical fertilisers and pesticides were introduced way back in 1957. During this time the main agricultural activity was rice farming. This still holds true up to now. Changes in agricultural practices started when villagers began growing other crops like beans and corn in 1971. From this period on, other modern technologies in agriculture were introduced.

The development of aquaculture in the village started in 1976 when villagers began digging ponds. Although it was not illustrated in the historical diagram, different practices in aquaculture and fishing began to evolve beginning that year. Most of the aquatic animals got affected by diseases and natural calamities since 2534, thus decreasing the population of species in the village. From past to present, flooding brings good and bad effects on the environment particularly on the aquatic systems.

At the moment, the development of the village is still on going. Organisations and government projects are still helping the village to improve its conditions. However, there are still some problems like flooding which hinders the village's development since the area is situated in a low area of the province.

***Mapping the Social Context***

*Kudload village*

One of the criteria used in selecting the village was its economic level. The village is relatively poor. This is true because of the limited source of income and the frequent flooding especially during rainy season. Using the villagers' criteria, the community has six (6) social groups. The different characteristics of each group are presented in Table 2

### **Socio-Economic Characteristics**

**Land ownership.** Like in other villages, ownership and the size of the land owned dictate the level of well being of the villagers in this area. The difference between the sizes of land in each level is not so significant. For poor families the land owned is generally up to 3 *rai* only and in some cases families do not have land at all. The better-off families in this village own even up to 100 *rai* of land. The land was either inherited from the family or bought from several farmers in the village.

**Source of income.** Regular source of income and the amount of income were also used to determine the well being of the household. In this village a majority of the people are farmers and are earning more income from this activity. Other families have other sources of income. For poor families who are fully dependent on farming, they gain income from working in other's farms. Some families also work as wage labour in other places like in construction. Middle and better-off families have other sources of income aside from farming. Some families from better-off groups receive regular salaries from their job as government employee. There are also those from the same group who get remittances from their relatives working outside the village or country.

**Livestock.** Ownership of livestock was also used in classifying the well being of an individual/household. In most cases, better-off families own a large number of livestock. They grow livestock for selling and for using in the field. In some cases they also earn income from their livestock by letting other farmers rent it for farming activities. Resource-poor families usually do not own livestock. Some families under this group grow livestock for other people and they can only get a percentage of income from this. On the average, middle group families have 3 - 5 heads of livestock. The number of livestock for better-off families usually ranges from 4 - 10 heads.

**Farming equipment.** Resource-poor families rarely own good farming equipment. Due to a limited area for farming and not being able to afford to invest in such equipment, poor families tend to have simple equipment only. Sometimes, they just borrow or rent from other farmers. A very common equipment that is used to classify a farmer as well off is the tractor. Better-off families can buy two-wheel tractors to be used for their farming activities as well as for transport. Although it was not given as one of the characteristics, some families in this village even own a rice mill.

**Access to formal credit.** The last criterion used by villagers is the capacity of the family to pay loans and to get loans from lending organizations. In general, poor families do not want to get loans although they badly need it. The main reason is that they are not confident that they can repay the loans. Some villagers under this group cannot get loans because the lending organization could not be convinced that they are able to pay. Poor families can only get loans from informal lending, from relatives and normally in small amount that they cannot even use as capital for a farming activity. The

middle and better-off groups have more access to formal credit. BACC can also provide credit to everyone in the village.

**Table 2 Characteristics of well-being ranking in Kudlod village**

Rank	Group of men	Group of women
<b>I</b>	Land less Some own land ( 3rai) Rent land for growing rice/vegetables Oldest, living alone	Mostly landless Some have land (3 rai) Renting land for cultivation Cannot pay loans No livestock Mostly old people Living alone
<b>II</b>	Have livestock (3 - 5 cow) Land holding of 8 - 20 rai Can get loan from BACC Capacity to pay loans	Land holding of 6 - 7 rai New family Acquired livestock from parents (1-2 cow)
<b>III</b>	Land holdings of 20 - 30 rai Have livestock ( 3 - 5 cows) Get remittance from young member of family Can get loan from BACC Capacity to pay loans	Land holding of 10 - 20 rai 2 wheeled tractor have 2-3 cows
<b>IV</b>	Land holdings of 40 - 70 rai Mostly government officer Can save money Trader Can lend money to others (get interest) Have livestock (> 10 cows)	Land holdings of 30 rai Supported by children With some loans 2 wheeled tractor Trader Have livestock (3-4 cows)
<b>V</b>		Inherit some property from parents Have livestock ( > 5) Some working in the government Have 2 wheeled tractor Some in construction Supported by children
<b>VI</b>		Land holdings of 60 - 100 rai Some in construction Government officer Have more than 10 cows Inherited lots of property

### Activity Profile

The importance of a resource somehow dictates the priority in activities of the villagers. All the groups mentioned many different activities but ranked rice cultivation as the most important activity in the village.

In terms of well being ranking, there is not much difference between the lists of important activities. Both groups have non-farming activities that are important to them. For the rich men group, merchant and construction work are considered important activities. The poor men do not have these but instead they regards as important the collection of food in the forest. For women, non-farm activities got ranked highly by both groups (rich and poor). Housework and weaving were mentioned and ranked high by rich women. For poor women, housework was not ranked/mentioned since most of the time they need to go to work to support their husband. Household chores are taken cared of by their children.

**Table 3 Summary of Important Activities in the Village by Well-being and Gender**

Economic group	Gender	
	Men	Women
<b>Rich</b>	Rice cultivation Livestock Poultry* Fishery* Charcoal Merchant Hired labour Construction work	Rice cultivation Livestock* Housework* Vegetable crop Weaving Fishing Collect food in the forest Silk worm
<b>Poor</b>	Rice cultivation Hired labour Fishing Livestock Making charcoal Collect forest food	Rice cultivation Livestock Weaving Vegetable crop* Making charcoal* Hired labour Merchant Fishing

Although fishing was not ranked very highly in all groups, it was mentioned as one of the important activities in the village. Both poor and rich men ranked fishing in the same level. On the other hand, women gave a lower rank for this activity since they do not go fishing often. For both poor and rich men, fishing is considered as income-generating while for women, fishing is for subsistence only. Fishing is also just a seasonal activity for women especially during the rainy/flooding season.

### **Seasonality**

The calendars made by the different well-being groups have various starting dates. For poor men and women, the calendars start in January. For rich men the calendar starts in March while the rich women's version starts in December. The start of a calendar normally relates to the activities of an individual but in this exercise, the calendars relate to several factors like weather, activities, festivals, etc.

**Weather.** In general the village has three seasons: summer or hot, rainy and cold season. The hot season starts almost the same time in all groups although for poor men and women, it starts to get warm in February. The duration of the hot season seems to be very short with the rich men as presented in Annex 1.1. The rainy season is the same in all groups. Generally the rainy season starts in mid-May and finished in mid-October. In between this period floods are expected to occur especially in August. For the cold season, this village experienced three months of cold temperature. In late October, the temperature begins to go down and will start to go up again in February.

**Tradition and culture.** Festivals and celebrations are one of the ways culture is shown in an area. This village has a lot of festival activities. Majority of the celebrations are related to their religion and traditional beliefs. Socio-economic standing is not a limitation in festival celebration in this village. As presented in Annex 1.1 - Annex 1.4, all of the groups celebrate the same festivals. However, for poor women, July is not a month for celebration.

**Economic activities.** A number of different activities were listed in Table 4. Generally, the location of the village and the most common/important resource also influence the ranking of economic activities with the villagers. Since the village has a big portion of paddy fields, all groups considered rice cultivation as their most important economic activity.

**Table 4 Summary of Economic Activities in the Village by Well-being and Gender Group**

Economic group	Gender	
	Men	Women
<b>Rich</b>	Rice cultivation Livestock raising Hired labour Fishing	Rice cultivation Silk worm Weaving Livestock raising Vegetable crop Fishing
<b>Poor</b>	Rice cultivation Livestock raising Hired labour Fishing Charcoal	Rice cultivation Vegetable crop Weaving Livestock raising Hired labour Fishing

Gender implications are evident in the villagers' level of activities and their priority. As presented in Table 4, all of the activities of both rich and poor men were all productive or income generating. On the other hand, women have some activities for household benefits only like gardening or growing vegetable crop. Although in some cases, vegetable cropping can also be an income earning activity especially for those families with capital to invest in growing high value vegetables. In general, the economic activities in this village are limited only to agriculture or farming activities.

All of the groups consider fishing as an important economic activity. Some families started fishing for subsistence but at the moment most of the fishermen now sell some of their catch. Even though the larger water resource is far, villagers still benefit from other water resources in the village. As presented also in Table 4, the fishing area in the village changes according to the season. During the dry season farmers collect AA from big bodies of water like streams and community pond. During the rainy season, rice field fisheries become very important.

Economic activities are available in the village in the year. During planting season some of the economic activities get set aside and villagers tend to prioritise farming. There is no definite schedule for planting or farming in the village. They all wait for the rain to come before they start cultivating their land. Other economic activities are done part time during the farming season and full time towards the end of the rainy season.

**Income.** Income sources of the different groups also depend on the season. For poor men, income from rice is during rice planting since most of them are working in other farms. They also earn income during harvest either from their own production or from working in other farms. Aside from farming, during summer poor men also get income from working in construction sites. Selling rice is the major source of income by poor women in this seasonal calendar. For rich men and women, aside from selling rice, the rich women also sell silk cloth. Selling livestock is also a major source of income for both groups during summer.

**Migration.** Most of the villagers do not go outside the village to work. During the PRA it was only the women group who mentioned the migration of younger household members to work in Bangkok. Generally most of the villagers go to Bangkok to work as factory workers, vendors, drivers and housekeepers. Like in other villages, household members who migrated to Bangkok return to the village only during festivals or during the farming season. Other villagers send remittances to their families.

**Health.** Generally the health condition of the village is satisfactory. Villagers can get ordinary colds and fever regardless of the socio-economic group. Sickness normally occurs during the end of season or during drastic changes in the weather. During farming season most of the villagers are very tired especially poor families since they need to work longer hours in the field than the rich group.

### **Role of Aquatic animals**

Aquatic animals are important to the villagers. Although fishing was not identified as their most important activity, AA still has a role in the livelihood of the

villagers. Many villagers benefit from the presence of aquatic animals in their community.

**Food supply.** Most of the criteria used by the villagers in ranking the importance of aquatic animals are related to consumption. Taste and versatility in cooking were often the two highest ranked criteria by all groups. This means that most of the fishermen in the village collect AA for their own consumption. The source of protein is not a problem in the village since farmers can collect AA in most of the aquatic systems in the area.

**Source of income.** As presented in Table 6, only the group of poor men did not use the price of AA as a criterion in ranking the importance of species. The reason behind this is that poor men usually do not sell AAs. Rather, it is the wives who sell or prepare the collected AA.

### Important Aquatic Animals

There are a lot of aquatic animals identified by the villagers that are present in all of the aquatic systems in the village. Majority of the AAs identified by the villagers are wild aquatic animals. The group of women identified 42 species that are available in the area. In general, the wild species identified were big fishes. In Table 5, the most important AAs are presented and it is evident that very few small and non-fish were among the top list.

There is not much difference in terms of what are considered as the important species for the rich group and the poor group. Both socio-economic groups have snakehead and walking catfish as the most important species, followed by either non-fish or small fishes. Even in terms of the gender factor or influence, there is not much difference in the species that ranked high.

As discussed earlier, most of the identified species were ranked high because of their taste and value. In all groups the most important species like chana and snakehead have good taste and dictate a high price in the market (see Table 6).

**Table 5 Summary of Important Aquatic Animals in the Village**

Economic group	Gender	
	Men	Women
<b>Rich</b>	Walking catfish Snakehead Spotted spiny eel Yellow mystus Swamp eel <i>Ompok krattensis</i>	Snakehead Walking catfish Frog Swamp eel Freshwater prawn Climbing perch
<b>Poor</b>	Walking catfish Snakehead Common lowland frog	Walking catfish Snakehead Yellow mystus

	Yellow mystus* Swamp eel* Climbing perch	Climbing perch Spotted spiny eel Jullien's mud carp
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### Source of Aquatic Animals

From the village map that was drawn by the villagers, a number of aquatic systems were illustrated. The AA collected and used by the villagers generally come from these systems. The poor group in this community usually collect AA from community water bodies. The streams around the village and the public pond are some examples of community pond in the area. Aside from the community water bodies, rice fields also become a collecting area for small AA. With farmers that have land, AA is collected from ponds and trap ponds in their respective rice fields.

### Gear

The most common gear used in the village is the cast net. Majority of the farmers who collect AA have cast nets in their houses. The use of traps and handled net is also common in this village. The use of gears, like in other villages, also differs and depends on who is using it. Typically cast net are used by men and scoop nets and simple gear are used by the women and children.

**Table 6 Summary of Criteria for Ranking the Importance of Aquatic Animals**

Economic group	Gender	
	Men	Women
<b>Rich</b>	Taste Price Versatility Easy to catch	Taste Price Versatility Easy to catch
<b>Poor</b>	Taste Versatility Easy to catch	Taste Price Easy to catch* Preservability*

### Seasonality of Aquatic Animals

As presented in Annexes 4.1 to 4.4, the quantity of important species vary depending on the season. Not all species are abundant at the same time. In this village the seasonality of AA was divided into three seasons. Summer season is from March to May; June to September is the rainy season and October to February is the cold season in the area.



In summer, when some of the aquatic systems in the village have no water, some species become limited in supply. However, there are still species that seems to be unaffected by the condition. During this time, the rich men's group's perception is that all of the most important AAs are large in quantity. But this is not the case for rich women, who identified the walking catfish as having a small in population during this period. For poor men, frogs and climbing perch are limited during dry season. Poor women think that walking catfish, snakehead and climbing perch are limited during this period.

During the rainy season, not all of the important species are abundant. Some species like walking catfish and *mystus* are less in number during this period. Small AA and non-fish AA increase in population when the rain starts. See Annexes 4.1 to 4.4.

During the cold season when water is limited, majority of the important species are limited also. As presented in the exercise on seasonality of important AAs, only the climbing perch and *mystus* are abundant, although for the poor women most of the species are abundant.

The place/location for collection of AA also depend on the season. Regardless of the socio-economic group, villagers collect AA from big water bodies like streams and community ponds during the dry and rainy seasons. For rice fields, collection of aquatic animals can only be done during the rainy season when the fields have water that come from the canals, streams and rain. Frogs are abundant in the rice fields during the rainy season.

### ***Trends of Aquatic Animals***

In general the trend or the situation of important AAs in the village is not consistent. There were periods when AAs are declining and also period when AAs are increasing in population. During the conduct of the PRA the situation of the AA seemed to be in good condition. Most of the important AAs identified where either on increasing trend or stable but still there are some species that are declining. The decline and increase of population of AAs can be attributed to several factors. All groups mentioned the same reason for the decline and increase of population of AA, although the reasons mentioned did not occur at the same time. See Annexes 5.1 to 5.4.

### **Factors Affecting the Trend**

**Natural calamities.** The village has been experiencing calamities since its beginning. Drought and flooding are the most common calamities that the villagers experienced. In some cases calamities have a good effect on AA. However, most of the time, the effect is negative. The drought is a major calamity that hit the village in 1997 and during this period majority of the important AA decreased. A lot of water bodies dried up during this period. Rain and flooding can have two effects on AA. In 1999 to 2000, the village experienced long heavy rains and flooding and this resulted to the increase in AA population. But in some cases flooding can also carry diseases, waste and move AA to other places.

**Agricultural waste.** As presented by all groups in the AA trends, agrochemicals had a negative effect on AA. One of the major causes of the decline of AA in 1963 was

*Kudload village*

the introduction of chemicals in the paddy fields. Extensive use of commercial fertilizers and pesticides or the intensification of agriculture posed problems on AA in the rice fields and nearby aquatic systems.

**Diseases.** Another thing that cannot be avoided in an aquatic system is the occurrence of disease. Farmers believe the diseases of AA are also brought by the intensification of agriculture. As presented in the trend diagram and in the timeline of this village, the fish disease occurred after the introduction of chemicals in agriculture. A lot of AA species get infected by disease especially during the cold season and in summer, particularly those AA found in trap ponds and pond in the rice fields.

**Over fishing.** The increasing population in the village also has an impact on the AA in the area. As the population increased, the demand for food also increased. Thus, the fishermen needed to collect more. Because of the limited aquatic systems in the area, fishermen tend not to select the species or be particular of the stage of the species that they are collecting. The collection of juveniles is now being practiced due to the limited supply.

### **Farmers' Meeting**

The last important activity of the PRA was the meeting with the farmers and some of the villagers. Although not all the participants attended the meeting, the activity was successful. This meeting was done after the group had translated all the outputs and collated the information. The team also made a simple summary of the outputs to show the differences and implications in terms of gender and well-being. During the meeting some unclear issues were clarified with the farmers and participants checked and verified the interpretation done by the team. The villagers acknowledged that they also learned a lot during the exercises and they intend to use the data collected to plan for the village development.

**Annexes**

PRA Outputs



Annex 1.2 Seasonal Calendar of Rich women

	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	
Climate	Cold	Very cold	Less cooler	Starting to warm	Very hot	Start rain	Raining	Heavy rains	Rains Flooding	Flooding	Start to cold	Cold	
Tradition/ culture	End of year	New house ceremony Wedding	Sticky rice festival	Buddist lent	Songkran	Village festival	Rocket festival	Buddist lent	Village festival		End of buddist lent	Loi Kattong Kattin Wedding	
Rice cultivation	Transport to storage	Keep rice straw				Ploughing	Seedling	Transplanting, fertilizer application, weeding				Harvest	
Silk worm		Keep worm											
Weaving			Silk weaving										
Livestock (Cattle)			Take care in rice field						Harvest grass for feeding				
Vegetables	Growing		Harvest										
Homework	Busy whole year												
Collect food from forest						Collect mushroom, insect, bamboo, ant eggs, wild veges							
Fishing						Collect tadpole					Collect from paddy (reduced water)		
Income/ busy	Sold rice		Sold silk cloth					Hired transplant rice		Sold rice		Hired labour to harvest rice	
								Busy for rice cultivation			Busy for harvesting		
Migration	Mainly working in the village only												
Health	Colds and fever					Happy			Sad due to weather			Happy	



Annex 1.4 Seasonal Calendar of Poor women

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Climate	Cold	Cold starting to warm	Hot	Very hot	Hot starting to rain	Rain	Heavy rains		Rain	Less rain start to cool	Cold	Cold
Tradition/culture	New year Rice ceremony	Sticky rice ceremony	Buddist lent Wedding	Songkran	Village festival		Buddist lent	Rice ceremony		End of buddist lent	Loi Krattong Wedding	
Rice cultivation	Keep straw				Rice broadcasti ng Fertilizer	Ploughing	Rice transplanting		Fertilizer		Harvesting	Transport Storing
Vegetable garden	Grow bean, sweet corn	Onion garlic	Chilli egg plant									
Weaving	Silk weaving				cotton							
Livestock	Release in the field				Tie/pens		Keep in pen and feed with rice straw				Tie	
Hired labour		Hire for make up					Pulling seedling and transplanti ng				Hire for rice harvesting	
Fishing	Digging for snail					Collect rasbora, tadpole (reduce water)						
Income/ busy	Sold rice				sold cattle				Busy period for cultivation			
Migration	Go to Bangkok ( driver, vendor, factory worker, housekeeper)											
Health		Free/happy			Infect disease (leptospirosis)		Children fever				Happy rice harvesting	

**Group activity profile****Annex 2.1 Important activities of Rich men**

Activities	Name of Farmers					Total	Rank
	Phrai	Boon	Panya	Pien	Thaweechai		
Rice cultivation	6	6	2	8	6	28	1
Labour in construction			2			2	8
Livestock	4	5		5	4	18	2
Hired labour	-		2		3	5	7
Make charcoal	3	3		3	2	11	5
Poultry	3	3	4	2	3	15	3.5
Fishery	4	3	4	2	2	15	3.5
Merchant	-		6			6	6
Total	20	20	20	20	20	100	

**Annex 2.2 Important activities of Rich women**

Activities	Name of Farmers					Total	Rank
	Jee	Bang-on	Puang	Chan pen	Sathian		
Rice cultivation	5	5	5	5	5	25	1
Silk worm					2	2	8
Livestock	4	4	4	3	3	18	2.5
Vegetable garden	3	2	3	2	2	12	4
Weaving		2	3	2	3	10	5
Housework	4	3	5	4	2	18	2.5
Collect food from the forest	1	2		2	2	7	7
Fishing (Capture)	3	2		2	1	8	6
Total	20	20	20	20	20	100	

**Annex 2.3 Important activities of Poor men**

Activities	Name of Farmers					Total	Rank
	Suchart	Khamsai	Lee	In			
Rice cultivation	5	7	8	9		29	1
Livestock	1	1	4	5		11	4
Hired labour	8	5	2			15	2
Fishing (Capture)	4	4	3	3		14	3
Collect food from forest	1	1				2	6
Make charcoal	1	2	3	3		9	5
Total	20	20	20	20		80	



## Annex 2.4 Important activities of Poor women

Activities	Name of Farmers					Total	Rank
	Boonkong	Boonhome	Yupin	Chanpen	Somma		
Weaving		4	4	4		12	3
Livestock	5	4		5	5	19	2
Merchant trade			4		4	8	7
Rice cultivation	4	4	4	4	6	22	1
Hired labour	2	2	3	1	2	10	6
Fishing/capture	3	2	1			6	8
Vegetable	3	2	2	3	1	11	4.5
Making charcoal	3	2	2	2	2	11	4.5
Total	20	20	20	19	20	99	

## Role of Aquatic Animals

## Annex 3.1 Identification and ranking of importance of aquatic animals by Poor Men

Aquatic Animals	Criteria			Total	Ranking
	Taste	Easy to catch	Versatility		
Lanchester's Freshwater Prawn	5	3	-	8	6
Snakehead	7	5	5	17	2
Walking Catfish	8	5	5	18	1
Common Climbing Perch	3	4	2	9	5
Water Bug	3	-	-	3	11
Giant Water Beetle	4	-	-	4	10
<i>Ompok Krattensis</i>	5	-	3	8	6
Yellow Mystus	6	1	3	10	4
Iridescent Mystus	3	-	3	6	8
Moonlight Gourami	2	-	3	5	9
Silver Rasbora	2	-	2	4	10
Green Blowfish	-	-	-	-	-
Snakeskin Gourami	3	-	1	4	10
Spotted Spiny Eel	-	-	-	-	-
Swamp Eel	5	-	3	8	4
Armed Spiny Eel	-	-	-	-	-
Jullien's Mud Carp	3	3	-	6	8
Nile Tilapia	5	-	2	7	7
Common Lowland Frog	4	3	4	11	3
	3	2	2	7	7
Bull Frog	4	-	-	4	10
Apple Snail	3	2	2	7	7
Snail	-	-	-	-	-
Pond Snail; River Snail	3	3	1	7	7
Common Carp	3	-	1	4	10
Common Silver Barb	4	-	3	7	7
Small Scale Mud Carp	2	-	-	2	12
Golden Little Barb	-	-	-	-	-
<i>Osteochilus</i>	4	2	2	8	6
Striped Tiger Namdid	-	-	-	-	-
Marbled Sleep Goby; Sand Goby	5	2	-	7	7
Striped Croaking Gourami	-	-	2	2	12
	4	-	-	4	10
TOTAL	103	35	49	187	

Kudload village

## Annex 3.2 Identification and ranking of importance of aquatic animals by Poor Women

Aquatic Animals	Criteria				Total	Ranking
	Taste	Easy to catch	Preservability	Good price		
Snakehead	5	4	3	2	14	2
Walking Catfish	7	4	3	4	18	1
Yellow Mystus	5	3	2	2	12	3
Common Climbing Perch	3	4	3	1	11	4
Jullien's Mud Carp	2	2	3	2	9	6
Silver Rasbora	1	4	1	-	6	7
Spotted Spiny Eel	2	4	2	2	10	5
Marbled Sleepy Goby; Sand Goby	1	1	-	1	3	
Nile Tilapia	2	2	1	1	6	7
Common Silver Barb	2	1	2	1	6	9
Spotted Featherback	2	-	-	1	3	
<i>Ompok Krattensis</i>	4	3	2	2	11	4
Snakeskin Gourami	3	-	2	3	8	7
Striped Tiger Nandid	-	-	1	-	1	
Armed Spiny Eel	3	-	-	3	6	9
Swamp Eel	2	-	-	2	4	
Common Crab	2	2	-	2	6	9
Moonlight Gourami	-	-	2	1	3	
Iridescent Mystus	2	1	2	1	6	
Pond Snail; River Snail	2	2	-	2	6	9
Great White Sheatfish	2	-	2	2	6	9
Lanchester's Freshwater Prawn	2	2	2	2	8	7
Common Lowland Frog	3	1	3	3	10	5
Small Toad	2	-	2	3	7	8
Bull Frog	2	2	2	2	8	7
	2	1	2	2	7	8
Siamese Glassfish	1	1	2	1	5	10
TOTAL	64	44	44	48	200	

## Annex 3.3 Identification and ranking of importance of aquatic animals by Rich Men

Aquatic Animals	Criteria				Total	Ranking
	Taste	Good price	Easy to catch	Versatility		
Walking Catfish	7	5	4	4	20	1
Snakehead	6	4	4	4	18	2
Common Climbing Perch	3	1	5	3	12	7
Spotted Spiny Eel	6	4	1	3	14	3
Marbled Sleepy Goby; Sand Goby	2	2	1	1	6	
<i>Ompok Krattensis</i>	7	4	1	1	13	6
Iridescent Mystus	1	2	3	1	7	
Yellow Mystus	7	4	2	1	14	3
Great White Sheatfish	5	3	-	2	10	9
<i>Osteochilus</i>	2	-	1	1	4	
Eye-spotted Barb	2	1	2	1	6	
Common Silver Barb	2	1	-	1	4	
Striped Tiger Nandid	-	-	-	-	-	-
Silver Rasbora	-	-	2	1	3	
<i>Pla eed</i>	2	1	-	1	3	
Siamese Grassfish	-	-	-	-	-	-
Armed Spiny Eel	6	4	0	1	11	8
Green Blowfish	-	-	-	-	-	-
Swamp Eel	7	5	0	1	14	3
Landchester Freshwater Prawn	3	2	2	2	9	10
Pond Snail; River Snail	1	1	2	1	5	
Blake River Crab	-	-	-	-	-	-
Common Lowland Frog	3	1	1	2	7	11
Small Toad	1	-	1	1	3	
Nile Tilapia	1	1	-	-	2	
Snakeskin Gourami	3	1	1	1	6	
Common Carp	1	1	-	-	2	
Small Scale Mud Carp	1	1	-	-	2	
TOTAL	79	49	33	34	195	

## Annex 3.4 Identification and ranking of importance of aquatic animals by Rich Women

Aquatic Animals	Criteria				Total	Ranking
	Taste	Easy to catch	Good price	Versatility		
Snakehead	5	4	5	4	18	1
Walking Catfish	6	3	4	2	15	2
Common Climbing Perch	3	2	-	4	9	4
Common Silver Barb	2	1	3	1	7	6
Nile Tilapia	2	-	2	-	4	
Spotted Spiny Eel	2	-	2	1	5	
Iridescent Mystus	2	2	1	2	7	6
<i>Ompok Krattensis</i>	3	-	3	-	6	7
Yellow Mystus	2	-	2	2	6	7
Three-Spot Gourami	-	1	-	1	2	

Kudload village

*Participatory Rural Appraisal*

Snakeskin Gourami	2	-	1	-	3	
Silver Rasbora	2	1	-	2	5	
Striped Croaking Gourami	1	-	-	2	3	
Common Carp	3	-	2	1	6	7
Small Scale Mud Carp	2	-	1	-	3	
<i>Pla eed</i>	3	-	-	-	3	
Lanchester's Freshwater Prawn	3	3	2	1	9	4
Jullien's Mud Carp	3	3	-	2	8	5
Marbled Sleepy Goby; Sand Goby	1	-	1	-	2	
Green Blowfish	-	-	-	-	-	
	1	-	2	-	3	
Pond Snail; River Snail	3	3	2	-	8	5
	-	1	-	-	1	
	-	-	-	-	-	
	-	-	-	-	-	
Insect	1	-	-	-	1	
Water Bug	2	-	-	-	2	
Common Skimmer	-	-	-	-	-	
	2	-	-	-	2	
	-	-	-	-	-	
	-	-	-	-	-	
Giant Water Bug	3	1	3	-	7	6
Mole Cricket	3	2	-	-	5	
Common Lowland Frog	3	3	4	3	13	3
Bullfrog	3	-	3	-	6	7
Blake Rice Crab	1	2	-	-	3	
Swamp Eel	3	-	3	3	9	4
Spotted Spiny Eel	3	-	2	-	5	
Siamese Grassfish	-	-	-	3	3	
Spotted Featherback	-	-	-	3	3	
Striped Tiger Nandid	-	-	-	-	-	
<i>Acanthopsis</i>	1	-	1	-	2	
TOTAL	76	32	49	37	194	

**Aquatic Animals Seasonality**

## Annex 4.1 Perception of rich men about the seasonality of important aquatic animals

Aquatic animals	Summer (March - May)			Rainy (June - September)			Cold (October - February)		
	Quantity	Gear/where	Who	Quantity	Gear/where	Who	Quantity	Gear/where	Who
Walking catfish	Many	Cast net (Stream, Huai kakwak)	Men	Abundant	Trident, fish rod, hole, traps (Paddy)	Men, son	Less	Cast net, drained pond (trap pond, stream)	Men
Snakehead	Many	Cast net (Stream, Huai kakwak)	Men	Abundant	Trident, fish rod, hole, traps (Paddy)	Men, son	Less	Cast net, drained pond (trap pond, stream)	Men
Yellow mystus	Many	Fish rod, cast net (Stream)	Men	Less	Fish rod, cast net (Stream)	Men	Abundant	Fish rod, cast net (stream)	Men
Spiny eel	Many	Dip net (Trap pond)	Women	Abundant	Fish trap (Paddy)	Men	Less	Dip net (Paddy)	Women
Swamp eel	Abundant	Eel hook (Trap pond)	Men	Abundant	Eel trap	Men	Less	Eel hook, dig (Trap pond)	Men
Ompok krattensis	Abundant	Cast net, gill net (Stream)	Men	Abundant	Gill net, fish trap (Paddy)	Men	Less	Cast net (Stream)	Men

Annex 4.2 Perception of rich women about the seasonality of important aquatic animals

Aquatic animals	Cold (November - January)			Summer (February - April)			Rainy (May - October)		
	Quantity	Gear/where	Who	Quantity	Gear/where	Who	Quantity	Gear/where	Who
Snakehead	30 %	Hole trap Dip net	Women	20	Dip net (Trap pond) Drained pond	Women	50	Fish rod Trap hole	Women
Walking catfish	10 %	Hole trap	Women	50	Drained pond	Women	40	Fish rod Gill net	Women
Frog	30 %	Fish rod	Women	20	Digging, hook	Women	50	Fish rod	Women
Climbing perch	40 %	Dip net (Collect from paddy)	Women	20	Drained pond	Women	40	Fish rod Gill net Fish trap	Women
Shrimp	40 %	Dip net Shrimp trap	Women	40	Dip net Trap	Women	20	Fish trap Shrimp trap	Women
Jullien's mud carp	30 %	Dip net	Women	20	Nylon blue net	Women	50	Fish trap Gill net	Women

Annex 4.3 Perception of poor men about the seasonality of important aquatic animals

Aquatic animals	Summer (January - April)			Rainy (May - September)			Cold (October - December)		
	Quantity	Gear	Who	Quantity	Gear	Who	Quantity	Gear	Who
Walking catfish	9	Cast net Gill net Trap Fish trap		6	Fish rod Gill net Fish trap (Chai)		5	Fish trap Fish rod Hole trap	
Snakehead	10	Cast net Gill net Trap Fish trap		6	Fish rod Gill net Fish trap (Chai)		4	Fish trap Fish rod Hole trap	
Frog	3	Digging		14	Frog rod Frog trap Battery and light		3	Frog trap Frog rod	
Spotted spiny eel	5	Spiny eel hook Dip net		7	Gill net String and rod		8	Fish trap (Chai) Cast net	
Climbing perch	4	Cast net Gill net		7	Fish rod Fish trap (Chai) Gill net		9	Hole trap Cast net	
Yellow mystus	14	Cast net Fish rod		3	Gill net String and rod		3	Fish rod Cast net	

Annex 4.4 Perception of poor women about the seasonality of important aquatic animals

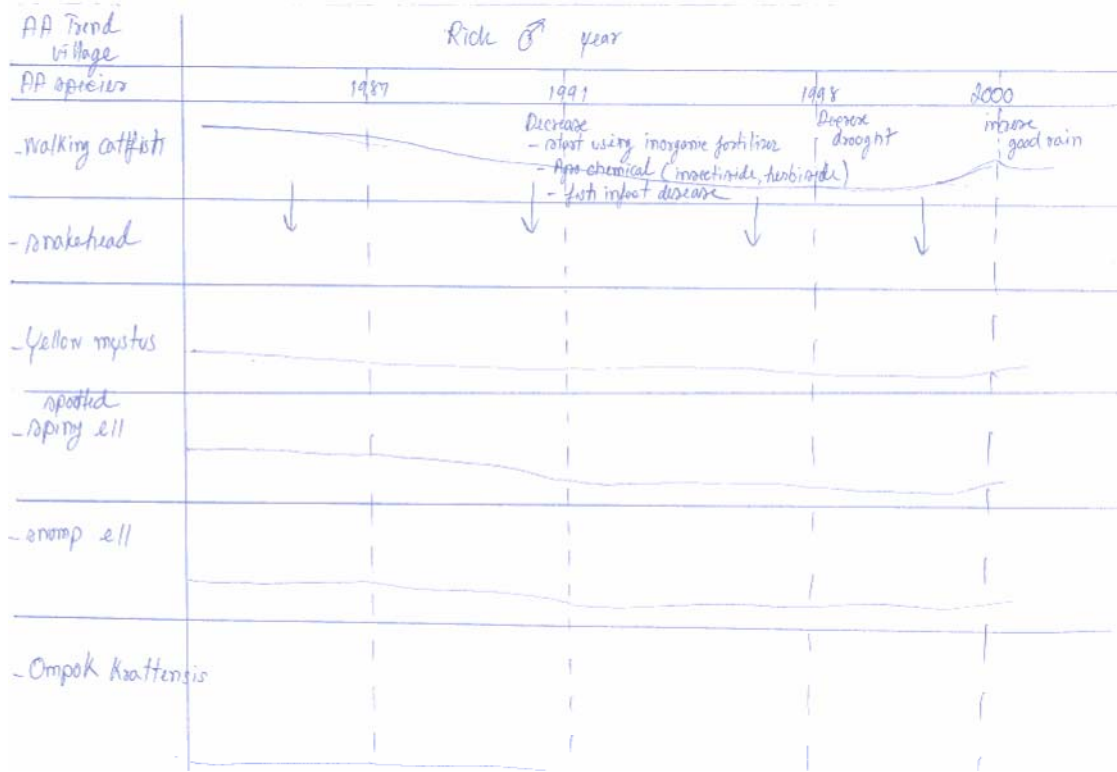
Aquatic animals	Summer (March - May)			Rainy ( June - September)			Cold (October - February)		
	Quantity	Gear	Who	Quantity	Gear	Who	Quantity	Gear	Who
Walking catfish (paddy/pond)	Less	Cast net	Men & women	Many	Fish rod Fish trap	Men & women + son	Abundant	Hole Drained pond	Men + women
Snakehead (paddy/pond)	Less	Cast net	Men & women	Many	Fish rod Fish trap	Men & women + son	Abundant	Hole Drained pond	Men + women
Yellow mystus	Abundant	Cast net Refuge trap	Men(most) Women(most)	Less	Fish rod	Men + son	Abundant	Cast net	Men
Ompok krattensis (Pond, paddy)	Abundant	Cast net Refuge trap	Men(most) Women(most)	Less	Fish rod	Men + son	Abundant	Cast net	Men
Climbing perch (Pond, paddy)	Less	Drained pond	Men & women Children	Abundant	Fish rod Hole	Men + women	Many	Dip net Bag net	Women
Spotted spiny eel	Abundant	Hook digging	Men & women	Many	Gill net	Men + women	Less	Hole net Dip net	Women



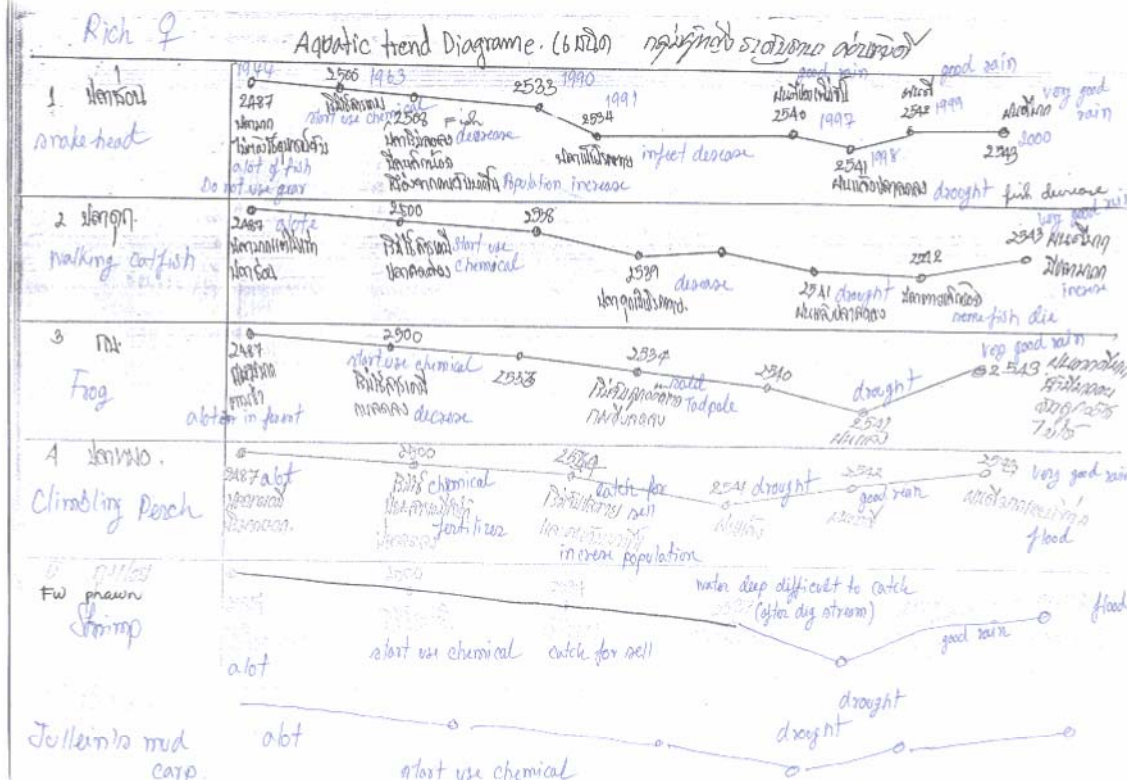


Trend of Aquatic Animals

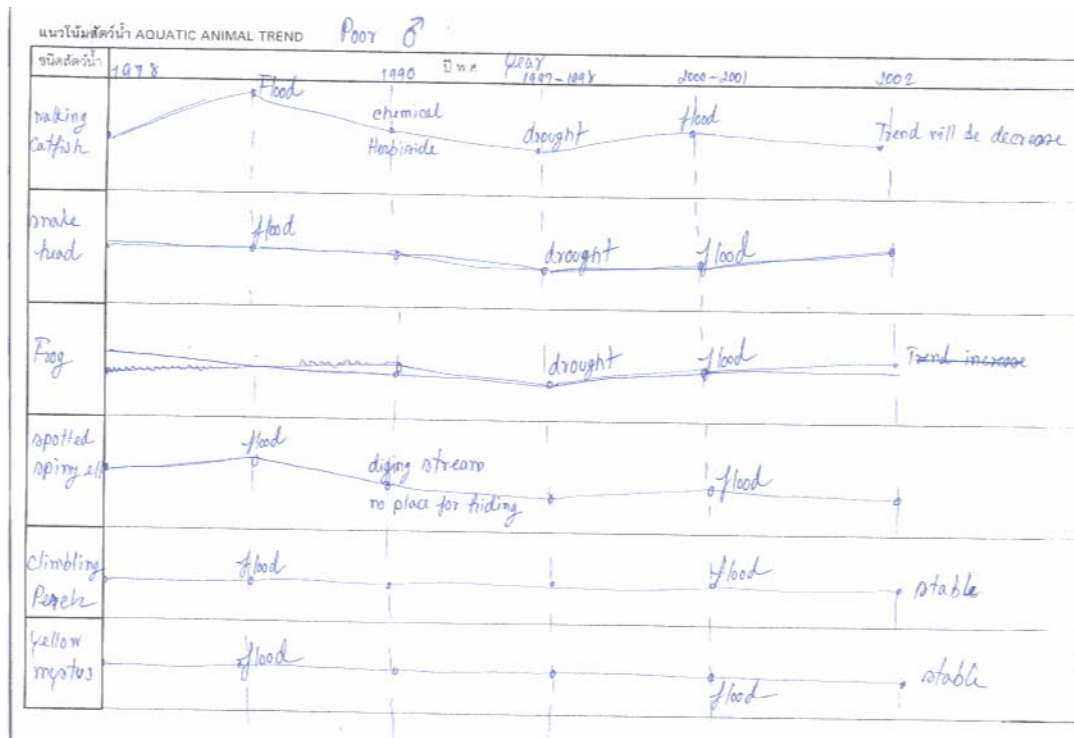
Annex 5.1 Perception of rich men on the trends of important aquatic animals



Annex 5.2 Perception of rich women on the trends of important aquatic animals



Annex 5.3 Perception of poor men on the trends of important aquatic animals



Annex 5.4 perception of poor women on the trends of important aquatic animals

