

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

Participatory Rural Appraisal in Angtasom Village

Case Study 8

(PRA Report from 2001)



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Table of Contents

Introduction	3
Background	3
Objectives	3
Participatory Rural Appraisal Team	4
Schedule of Activities	4
Takeo Province	4
Province Description	4
District Description	5
Commune Description	6
Selection Process for the Village	6
Specific Method Used	6
Process	7
Setting the Context	8
Mapping the Current Resources in the Village	8
Mapping the Development in the Village	10
Mapping Social Context of the Village	11
Socioeconomic Characteristics	12
Activity Profile of the village	14
Role of Aquatic Animals	17
Important Aquatic Animals	18
Sources of Aquatic Animals	19
Gear Used	20
Seasonality of Aquatic Animals	20
Trends of Aquatic Animals	20
Farmers' Meeting	21
Annexes	22
Seasonal Calendar	23
Weather	23
Social events	23
Health	24
Migration	25
Income/busy	26
Aquatic Animal Identification and Scoring	27
Seasonality of Aquatic Animals	31
Trends of Aquatic Animals	35

Angtasom Village

Introduction

Background

The present status of aquatic systems in the province as well as the effect of these aquatic systems to the people has not been established. For any development organization and even government agencies, knowing the general background of the village is very important. An outsider would not see the true and whole picture of the village unless proper baseline gathering is conducted. This information can be used to develop new programs or in designing relevant intervention activities in the area. It is also very important that the information is generated from and with the primary stakeholders themselves - the farmers/villagers.

A lot of development programs had been started in different villages and there have been some problems in sustaining these programs. Most common reason for the low success of development projects is the passive, "disengaged attitude" of the supposed primary stakeholders towards the project or program. This can be attributed mainly to the way the project or program was conceived and the planning process used. Frequently, development interventions are designed and managed using the top-down approach. Projects are initiated and planned at the top, with no prior consultation with the other stakeholders and no involvement of the intended beneficiaries in the planning process. Thus, the communities are left to just accept and accommodate the said "intervention". It is therefore necessary to listen to the villagers and to consult them first regarding the status of their area prior to starting any activity, rather than just thrusting information and expectations on them.

Objectives

The main objectives of the study are to assess the general livelihood activities in the village and to establish rapport with the villagers. To achieve these main 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 using participatory tools;
3. To work with the villagers in facilitating the identification of issues in the community.

Participatory Rural Appraisal Team

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Schedule of Activities

The workshop was done in three days, which also included the collection of secondary information about the commune and the village (see Table below). During the first day the commune office was visited. Secondary information was gathered from the office that helped the team identify the village for this study. Before the village was finally selected validation and additional information were asked from the head of the commune. A staff was sent to set appointment with village for the two days activity.

On the second day, the village profile was generated and participants for the next day's activity were identified. The last day of the workshop was used for collation and processing of outputs from the two days' activities. The last important activities done in the village were the validation of the information and getting feedback from the villagers.

Table 1. Schedule of Activities during the PRA in Angtasom village

Date	Activities
June 25, 2001	Commune visit
June 26, 2001	Introduction to the village Village profiling
June 27, 2001	PRA workshop Validation

Takeo Province

Province Description

Location. The province is located in the southern part of Cambodia. Takeo is 78 km away from the main capital of the country, Phnom Penh. The province can be reached by two routes: by taking the national road N°2 is about 78 km away and 87 km by national road N°3.

Total area : 348.015 Km²

Boundaries:

North : Kandal province

South : Vietnam

Eastern : Kandal province and Vietnam

Western: Kampong Speu and Kompot province

Administration. The province is composed of 10 districts with a total of 100 communes. There are 1,122 villages in this province.

District Description

Location. Tramkok district is situated 12 km away from the center of Takeo province. It covers a land area of approximately 55,045 ha on the western part of the province. The district can be reached by taking national road N°3 from Phnom Penh to Kampot province.

Boundary:

Northern	- Samrong district
Southern	- Chhouk district
Eastern	- Donkeo and Treang district
Western	- Chumkari and Chhouk district

General Description. Tramkok district differs from other districts because of its sandy soil, its topography which is high land, and the major agricultural product which is coconut. In general, this district is also famous for its large production of livestock particularly pigs and cows. Since majority of the population are farmers the total land area for rice cultivation is approximately 34,000 hectares.

Aside from coconut and rice, the crop production in this district is also diverse. Other agricultural products like watermelon, eggplant and cucumber are commonly produced in this district.

The district is also one of the poorest districts in the province due to its topography, which is upland. There are 5 upland districts in this province and Tramkok and Donkeo are the two districts that are considered the poorest.

Administration and Population. The district is composed of 15 communes with a total of 242 villages. It has a total population of 147,103. The women population is 51.63% or 75,954 females. The total number of households in this district is 27,954 with an average of 5.26 people per family. The population is estimated to increase at a rate of 2% per year.

Resources. The district is poor in water resource as compared to other districts in this province (like Angkor Borei and Borei Choulasa). The aquatic resources in this district used to be abundant but due to several factors these resources are now declining. There are two main water bodies namely Tomnoub Lok and Tomnoub Osaray. A reservoir is also present. These resources are the main sources of aquatic animals in the district.

Rainfall. The rain pattern in the area changes every year and so there is no rain pattern that can be established in the area. In general the rain comes during the period of May to October.

Source of Income. Aside from agricultural activities as the main source of income, residents from this province get additional income from weaving which is done by the wives. On the other hand, the husbands usually go to other places like Phnom Penh to work in construction sites.

Commune Description

General description. The commune is composed of 11 villages. Its total land coverage is approximately 2,423 hectares. The total land area being used as rice field is about 1,896 hectares excluding the area allocated for crop, which is approximately 39 hectares. Household or residential area is approximately 135 hectares.

Total population: 6,014 (3,113 women)

Villages:

1. Ang Tasom	155 families
2. Done Tout	63 families
3. Tropaing Snor	110 families
4. Ta Tea	165 families
5. Kro Ngoung	72 families
6. Kum Say	77 families
7. Slaing Korng	135 families
8. So Taun	88 families
9. Or Snaeoun	106 families
10. Reusey Srok	126 families
11. Kus	75 families

Selection Process for the Village

The village was selected using the criteria on the status of aquatic resources. In this study the project is looking at different aquatic systems and also the topography of the sites. During the provincial office visit, the district was selected because it is one of the highest areas in the province. From the district a commune was identified by drawing a transect line cutting through the district, traversing the upland to lowland areas, which is also from the western to southeastern part of the district. The transect line was divided into three parts and the commune was identified from the three portions of the line: Samrong, located in the high and drier area along a mountain, Kus in the intermediate highland area and Nheng Nhang in the wet highland area. Once the commune was selected, a visit was done to verify some secondary information about the commune. The village was then identified after the meeting with the commune head. Some of the bases used in the selection of the village were: the amount of aquatic systems present in the area; being a representative of a backward village (i.e. considered as one of the poor villages); and also the number of households for ease of management purposes. Angtasom was selected because it represents the lowest part of the district.

Specific Method 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 activity was conducted 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 illustrates 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 was meant to identify the common activities in the village and to differentiate the priorities of each group.

Aquatic animals identification/ranking. This was accomplished to find out the available and unavailable aquatic species in the area. This activity also determined how important each aquatic animal is to the villagers

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 perception 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 understood.

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

Process

The activity was divided into three parts. The first part was done with the village headman with the key informants. During this activity the profile of the village was established. The information about the present resources in the village was generated using the village mapping exercises, which was done by the village headman with the help of other key informants present in the meeting.

For the purpose of getting the social context of the village, the list of households was used by the team in the well being activity. The individual names were written down in cards and farmers/key informants identified the different social groups in the village. Using the results of this activity the participants for the next day activity were selected. Two groups of farmers representing the poor group and the better off group were identified. The team set an appointment with the selected people to participate in the activity for the next day.

The second part of the activity generated more detailed information about the activities in the village and how different social groups differ in their ideas. During this day men and women from poor and better off groups were separated into two. Seasonal calendars and activity ranking matrices were produced during this period. Information about aquatic animals and their importance were also generated during this day.

The last part of the workshop was the validation. After the team collated all the information generated from the first two days, the team made summaries of the important issues. The team returned to the village and had a brief meeting with the villagers to also validate some information. The follow-up discussion focused on clarifying the contradictory information and the vague ones.

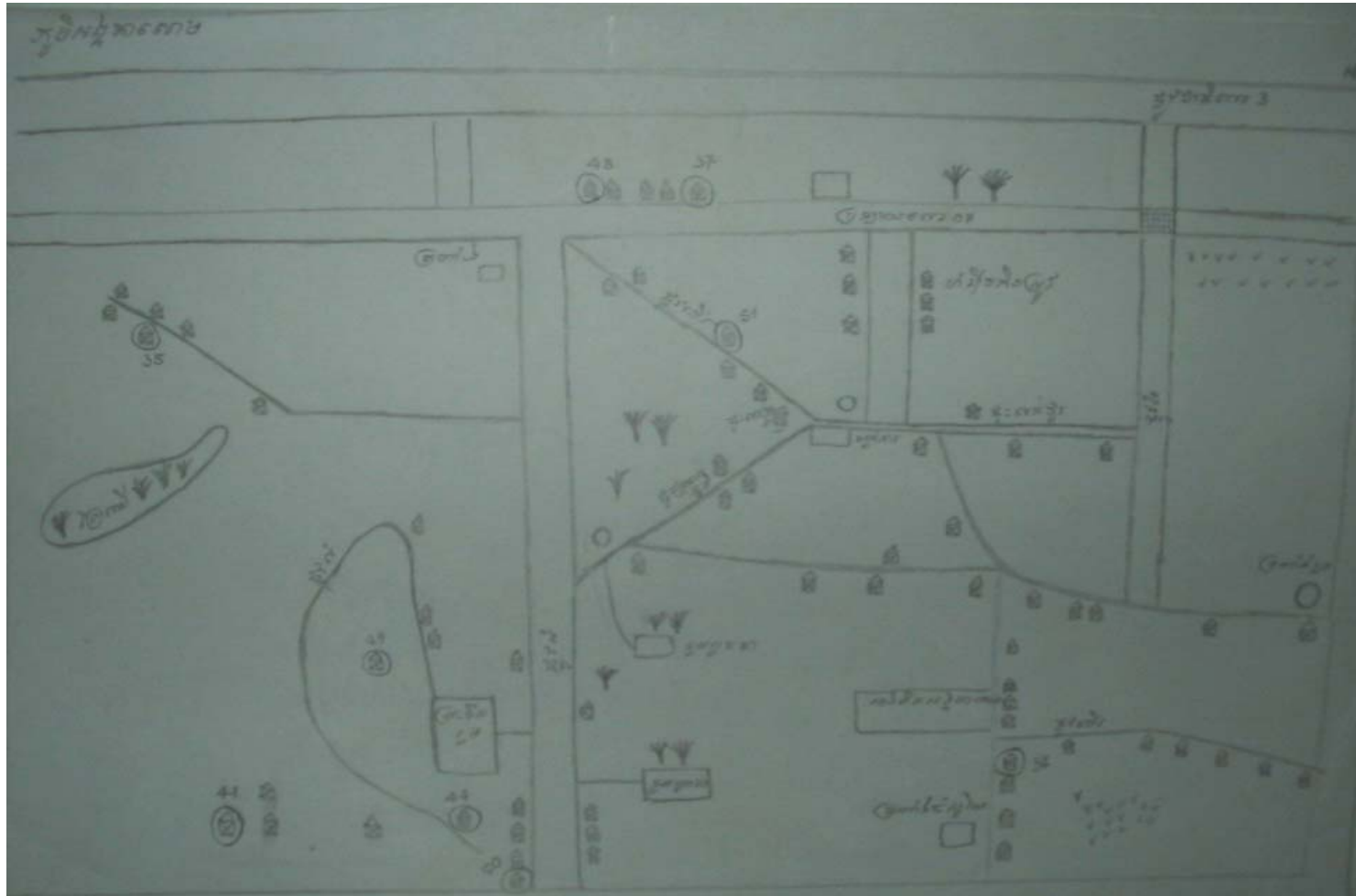
Setting the Context

Mapping the Current Resources in the Village

From the district representing upland and low in water resources, Angtasom village represents a site that is considered lowest in terms of topography in this district. Although situated in an upland area, the village still has some water resources. Mapping exercise was done in the village and the resources available were identified and illustrated in the map. The village headman and other key informants completed the exercise. The map showed the most important resource in the village.

Land resource. Land is the most important resource identified in the village. With agriculture being the main source of income, the land in the village is used mainly as paddy field. During some periods of the year, some parts of the land is also being used for other crops. On the map, paddy fields are marked and can be seen around the village.

Figure 1 Village Map of Angtasom



Water resource. A number of water bodies were identified as important resources in the village. Some of the systems are community based that are open access and some systems are individually owned. The main water body identified was the big canal where the main water supply for the paddy field is coming from. The big canal is connected to a small canal that runs to the paddy fields in the village. Other community-based systems are the reservoir (sometimes called "small lake") and community ponds. There are also individual or privately owned aquatic systems/water resource like ponds, ditches and trap ponds in the village which serve as sources of food and income for the villagers.

Physical resource. There are shops and rice mills in the village. Farmers always have access to the services present in the village and they do not need to travel outside the village. There is also a village house located in the center of the community, which serves as a multi-purpose center for village social activities.

Mapping the Development in the Village

The historical development review conducted by the farmers illustrated and recalled the different important events that had happened in the village from 1950 to present. During the exercise participants discussed political as well as economic issues and events, farming, and natural resources (see Table 2). Since 1950 the political situation of the village was the same like any other village in Cambodia. In the beginning there were only 17 households in the village. The situation in the community got worst when the coup happened in 1970. When the Polpot regime took over the government in 1979, people were forced into hard labor in the field, leave their property and majority got killed. During this period there was not enough food for the farmers and their family. They were deprived access to the natural resources available in the area and also they were afraid to go out. Although the present life of the people in the village is no longer that difficult, still, the development of their village had been slow.

The natural resources in the village during the early years were in good condition. Wild resources in the forest and the field were enough for the needs of the villagers. However during the Polpot regime, community-based rice production was enforced and they began clearing the forest, resulting to the reduction of other resources.

Aquatic species used to be abundant in lakes. At that time, only a few people collected aquatic animals and they would only use simple and traditional gear. However, the supply of aquatic animals started to decline in 1980 and continued until 1993. Aside from using modern or improved fishing gear, the number of fishermen also increased. At present the changes in the environment and illegal fishing are the main threat to sustaining the presence of aquatic animals.

Table 2. Historical Development of Angtasom Village

Year	Events
1950	<ul style="list-style-type: none"> -Before 1950 the village was called Srai Cheirnaing, Chray Tnot and Tuk Tlar. -In 1950 the village was re-named Angtasom, because the stone inscription showed the name Angtasom. -In the village there were 17 households with about 80 people. -There were forests around the village such as Chhoeu Teal and had Tigers, monkeys, wolfs, elephants. -The village had a small area of land for rice production, people cultivated seed like Piak Ronam, Phooin Chay, Kampingpoungs, Nang nong, Sambok Angran. -Fish resources were abundant in the lake, small lake, canal and rice field. At that time Isarak was established. -Tsarak collected people from 150 households together to extend the rice fields. -People lived happily
1970	<ul style="list-style-type: none"> -Coup flat in Phnom Penh. -The village was divided into two parts: Angtasom and Tuk Tlar -People forced to leave the village to go to another Commune. -People ploughed the rice, but they couldn't harvest. -People cleaned the forest for agricultural purposes, at that time the forest and wild animals were reduced. -Fish resources were abundant, people fishing by using gear like bag trap oblong trap, hard trap.
1975-79	<ul style="list-style-type: none"> -Pol Pot regime, people to eat as a community. -People worked hard, began to get burned out and they slowly died of starvation. -In the forest animal species declined in number. -The fish resources were abundant in some sub-communities and fishermen used gear such as trawl, cast net.
1980-93	<ul style="list-style-type: none"> -People gathered together 150 households to extend different species of rice -They planted rice once a year, because the soil quality was average as it was mixed with sand. -Forest resources got reduced and animals became less in number. -Saw a decline in fish resources in lake, small lake, and rice field. Fishermen used many different gears including cast net, gill net. -National election in 1993 which was peaceful.
93-2001	<ul style="list-style-type: none"> -There are 163 households in the village. -There are 182 hectares of rice field. -The forest was completely cut down and other fruit trees were planted. -National election in 1998. -Fish resources in the lake, small lake and rice fields were reduced. -The fishermen used different gears such as angle, oblong trap, hard trap, cast net and also included illegal gears like electro fishing.

Mapping Social Context of the Village

Angtasom is considered as one of the low-income villages in the community. The village is generally in a drier area, which is the main reason why farmers have low income due to one-time cropping of rice per year. This village is relatively poor. However farmers used their own criteria in classifying the well-being of the villagers. The size of the land is the most important and common criteria they used, together with other minor variables. The villagers came up with four groupings in the village using their own criteria although one of the villagers thought that farmers in the area can be grouped into five.

Socioeconomic Characteristics

Land ownership. Some of the farmers belonging to the poor group do not have land because they used their land as collateral in getting loan from private lenders. These lenders eventually confiscated their land when these farmers failed to return the money they borrowed. On the average, farmers that own land in this category may have less than 1 hectare. The middle group, to which most of the villagers belong to, has at least one to two hectares of land. Better off families can have as big as five hectares.

Livestock. Like any other village in this province, probably in the whole country, the number of livestock can tell the well being of the villagers. Those families belonging to the extreme poor group do not have livestock at all. Middle and better off families have livestock from 1 to 6 heads.

Source of income. Working as a helper and selling fish and other small things in their house are the most common sources of income of the poor families in the village. Like the poor group, middle group can also work as helper to have additional income aside from rice production. In some cases, people go to other places to work in construction sites. For the rich or better off group, they have a diverse source of income, from renting their equipment and livestock to other farmers, to providing services like operating rice mills.

Food supply. During the lean season, poor families particularly those in the extreme would only have food for 6 months. After this period, finding food would be a challenge. Even the middle group would have problems with food supply for at least 3 months in a year. The better off families can produce enough for their own consumption.

House material. Houses of poor families in the village are commonly small and made of clay and leaves. The houses of the middle group have better roofing compared to that of the poor families. In general better off and middle group families have bigger houses made of wood, using leaves as walling and have either galvanized iron or cement tiles as roofing.

Transport. Bicycle is the most common form of transport in the village. Better off and middle group families have either bicycles or motorbikes.

Other assets. Other assets refer to equipment present in the house like appliances, fishing gear and agricultural tools. Majority of the poor family do not have anything inside their house apart from a box where they keep their belongings. For middle and better off families, some of them have appliances like radio. Better off families also have farming equipment and rice mills that poor families do not have.

Table 3. Well-being Ranking in Angtasom Village

	Trial I	Trial II	Trial III
I	Own small house with leaf roofing No livestock Use their land as collateral to group 5 Work as helper Big number of family(7) No appliances	Small house with leaves as roofing No appliances No land Work as helper in the village Only 40% owns livestock Big family (8 members)	Small house with leaves as roofing No appliances Have small land (30 A) Food enough for 6 months No appliances make basket and fishing for selling Selling at home Average of 6 members of the family Has limited livestock (1cow) Use small amount of fertilizer
II	Small house with leaf roofing Use land as collateral Production for food consumption Have bicycle Small transistor Own land from 1 - 2 hectare Food enough for 6 months 1 - 2 cows work as helper Migrate to PP for construction Work around the village Making basket as other source of income Selling livestock, fish Big family (7) Can use chemical fertilizer	Small house with tiles and GI sheets roofing Have transport Appliances like TV cassette player Own at least 1 - 1.5 ha. Enough food for ten months 1 - 2 livestock average member of family (6) Make basket for selling	Small house with leaf roof Some houses with tiles and without wall Have bicycle Appliances like cassette player Own land from 60 -70 R Enough food for 9 months Make basket and fishing gear for selling Work as helper Get debt from rich group 1 - 2 livestock Average number of 7 members in the family Can use chemical fertilizer from 1 to 2 sacks/ha
III	House made from wood with GI sheet roofing or tiles Have bicycle Have appliances like TV, cassette player Operating rice mill Own land (2 - 3 ha) Have enough food to eat 3-5 livestock Average number of family of 7 members	House made from wood with tiles roofing Have transport Appliances Own land from 2 - 3 ha. Enough food to eat and sell 1 - 2 livestock At least 5 member of family Fishing for family consumption	Majority have tile roofing Have bicycle Appliances like TV, cassette player, radio Operating rice mill Water pump Own land from 1-2 ha Enough food to eat and sell 2 - 3 livestock 5 member of family Can used chemical fertilizer (1 - 2 sack/ha)
IV	House made from wood with tiles roofing Have transport service Have colored TV Cassette player and radio Operating rice mill Own land from 3 - 4 ha. 3 - 4 livestock Have enough food Provide rice as credit Average number of 5 members	House made from wood with tiles roofing Have motor bike and bicycle Appliances like TV, cassette player Operating rice mill Water pump Own land from 4 - 5 hectare Enough food to eat Provide rice as credit 3 - 4 livestock 4 members of family	House with tile roof Have motorcycle and bicycle Operating rice mill Water pump Appliances like TV, cassette player 1 - 2 ha land Enough food to eat and sell Provide rice as credit 2 - 3 livestock Average member of family 4 Use chemical on (3 sacks)

V	House made from wood with tiles roofing Have transport service Have colored TV Cassette player and radio With generator Water pump Own land from 3 - 5 hectare 5 - 6 livestock Enough food to eat Provide rice as credit Average number of family -5		
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Activity Profile of the village

Even though water resource is limited in the area, rice production is still the most important activity in the village regardless of the social group the farmer belongs to. Farmers in the village have a diverse range of activities. Most of the activities that are important to the villagers are related to income generation. All groups in this village mentioned no reproductive activities like housework.

Table 4. Summary of Important Activities in the Village by Gender and Socioeconomic Group

Socio-econ group	Gender	
	Men	Women
Rich	Rice production (170)	Rice production (69)
	Cropping (82)	Livestock (58)
	Livestock (75)	Cropping (37)
	Wage labor (11)	Make farm equipment (30)
	Make farm equipment (2)	Fishing (24)
		Collect wood (15)
	Selling (11)	
Poor	Rice production (79)	Rice production (126)
	Livestock (40)	Cropping (52)
	Cropping (33)	Selling (19)
	Fishing (30)	Livestock (69)
	Work as helper (22)	Collect wood (49)
	Selling (13)	Wage labor (14)
	Collect wood (3)	Making mats (26)
		Fishing (23)
		Art (4)

Different groups in the village have different priorities although the activities are not that varied. However, the group of poor women has the longest list of activities (9 activities). The list of the rich and poor groups respectively shows some differences. The poor group cited some activities that the rich group did not mention such as weaving

and working as helper which were ranked as one of most important activities. On the other hand, the rich group considers making gear as an important activity, but was not the case for the poor group.

For the men and women, most important activities are the same but differing in some. Collecting wood and making mats were not considered by the men as important. This is because it is not very common that men weave, and it is the female members who collect wood in the forest. Most of the activities that are important to men are those that are more labor intensive and probably could earn more income. Fishing was one of the most important activities in the village although rich men did not mention it.

Seasonality

Weather

Generally there are three distinct weather conditions in this village. Rainy season is the most awaited season in the village because rain is the only source of water for their rice cultivation. The rainy season usually starts in April or May, with the peak happening during the period of August to November. Hot weather is the longest season in the village because in some cases even if it is raining, the weather is still warm. Villagers experience cold weather from November to January.

Social events

Festivals and celebration in the village reflect its culture and tradition. Regardless of the social strata they belong to, villagers celebrate most of the festivals in the village especially when it is related to their religion and beliefs. Some farmers have ceremonies that are connected to activities in the rice fields. In June one of the social activities in the village is the ceremony that prays for water. Plowing field, transplanting and harvesting are some of the ceremonies practiced in the village. Other festivals are related to the Buddhist religion.

Economic activities

The seasonality calendar was done to illustrate the situation of the village in terms of their livelihood in a year. Each group produced their own distinct seasonal calendars. The table below shows that the lists of economic activities per group are almost the same, though there are some minor activities listed in each group. In general all groups identified four major economic activities: rice production, cropping, fishing, and livestock production.

Aside from food-related, agriculture and economic activities, all groups mentioned other activities like making mats, fishing gears, farming equipment etc. Among the groups, only the rich men do not do trading as a source of income.

Figure 2. Summary of Economic Activities in the Village

Socio-econ group	Gender	
	Men	Women
Rich	Rice production Cropping Fishing Livestock Collect palm juice Making farming tool Making fishing equipment Wage labor	Rice production Cropping Fishing Livestock Collect wood Making farm equipment Trading
Poor	Rice production Cropping Livestock Fishing Making basket Making fishing gear and farming tool Making rice wine Trading	Rice production Cropping Fishing Livestock Making farm equipment Collect wood Wage labor Trading Art

The seasonality of the different economic activities however differs from one group to another. There are some activities that are done the whole year and there are some activities performed in just some months of the year. For the men, working as laborers or paid workers is the economic activity that both socio-economic groups mentioned that they do the whole year. There are also five major activities performed by men the whole year. However not both groups do these activities. The poor men cited trading and working as laborers, unlike the rich group who mentioned crop production, fishing, working as laborers and rice production. The rest of the listed activities are done depending on the season or weather. Most of the seasonal economic activities are performed during their spare time during summer, apart from their main agricultural activities.

For the women, there are also some differences in the list of seasonal and year-round economic activities. The poor group of women identified livestock production, fishing, trading, and making farming equipment as year-long economic activities while rich women group only identified livestock production (see annexes-Seasonal calendars). The rest of their economic activities are seasonal. The season for rice production for each group also differ. Poor women begin their rice production activities in the month of April while the rich women start in May. The poor women have no rice-production related activities during the period of August to October. On the other hand, for the rich group, it's continuous from May to January which is the harvesting month. The month for cropping other crops is also different for each group. Poor women have a longer period of growing other crops. For fishing, rich women have a shorter period of time in collecting AA. Usually rich women collect during the peak of the rainy season.

Other economic activities listed in the table are being done seasonally depending on the weather, available time of the farmer and the resources.

Migration

Like others villages in the province, most of the villagers particularly those in the middle age would migrate or move to other places like Phnom Penh to have additional income during summer. Villagers will start coming back to the village when the activities in the field are already starting. Other villagers especially the young ones normally just stay in Phnom Penh to work in garment factories.

Health

Generally the health condition in the village is satisfactory. No serious epidemic has been recorded and most of the farmers get common illnesses like flu, stomach problems, fever and colds. In most cases, all groups tend to get sick during the end of the season with cases of flu, fever and colds occurring during the peak of the rainy season.

Role of Aquatic Animals

The importance of aquatic animals depends on the role that it plays to the villagers. The people themselves have their own basis in ranking the importance of aquatic animals in the village, coming up with eight criteria. Unlike other villages, Angtasom considers "high value" as one of the important criteria, and was even ranked higher than the "consumption" factor. Among the 8 criteria used, consumption can be related to two roles of aquatic animals to the villagers which are: (1) as source of food and (2) as additional source of income.

Food source. Some of the criteria used that relate to consumption are (in order of importance): (1) can be processed; (2) consumption; (3) taste and (4) bones (in order). Aquatic animals that are collected from the aquatic systems in the village play a very important role in the nutrition of the villagers. These aquatic animals can be utilized by the villagers without spending much because at the moment this resource is still open access to them. People collecting aquatic animals would first think of the needs of their family. Some fishermen only collect AA that are enough for their consumption and would go back to collect aquatic animals when their reserve ran out.

Additional source of income. "High value" maybe the most appropriate criteria used that directly relates to one of the major roles of aquatic animals, which is as a source of income. Some fishermen in the village get their secondary income from fishing. They sell some of their catch if they already have enough for their own consumption. Selling of aquatic animals is very common during the rainy season.

Table 5. Summary of Important Criteria in Ranking the Importance of Aquatic Animals

Socio-econ group	Gender	
	Men	Women
Rich	Availability (51)	High value (46)
	High value (45)	Availability (44)
	Easy to catch (36)	Can be process (27)
	Consumption (35)	Taste (27)
	Can be process (33)	Easy to catch (24)
		Family consumption (17)
		As feed (4)
Poor	Availability (39)	Availability (52)
	Easy to catch (35)	Taste (35)
	Taste (34)	Easy to catch (30)
	Consumption (29)	Can be process (26)
	High value (26)	High Value (26)
	Can be process (23)	Consumption (22)
	Bones (19)	Bones (7)

The importance of aquatic animals also depends on what group villagers belong to. In general, the availability of aquatic animals is the most important criteria used by the villagers. Since the community is situated in a higher location where year-round supply of water is impossible, aquatic animals that can be harvested almost throughout the year is very important. The farmers also considered the factors of "value" and "ease in catching" in ranking the importance of aquatic animals.

Between social strata, the ranking of importance have some differences, although both the rich and poor groups consider availability as the most important. The poor gave more importance on aquatic animals that have good taste and can be easily caught instead of its high value, which was the case with the rich group. This is mainly because the poor usually eat the aquatic animals they get to collect and would only sell if they have enough reserve already for their own consumption.

The women, who commonly collect and sell the aquatic animals, gave more importance to those aquatic animals that are always available, with high value and good taste.

Important Aquatic Animals

A total of 25 species have been identified as important aquatic animals in the village. Even though the water resource is limited, there is still a diverse variety of aquatic animals. There was no stocked species identified during the exercise. In general most of the important species are big fishes like snakehead, catfish and climbing perch. Among the top most species, 5 non-fish were identified as also important. Among the non-fish that were identified were shrimp, frogs, snail, crabs, and eel.

Table 6. Summary of Important Aquatic Animals in the Village

Socio-econ group	Gender	
	Men	Women
Rich	Snakehead (23)	Snakehead (19)
	Climbing perch (21)	Frog (18)
	Catfish (20)	Catfish (18)
	Small shrimp (15)	Catopra (13)
	Rasbora (13)	Crab (12)
	Spiny eel (12)	Whisker sheatfish (11)
	Crab (12)	Spiny eel (10)
	Snail (12)	Eel (10)
Poor	Snakehead (18)	Climbing perch (20)
	Catfish (16)	Snakehead (18)
	Climbing perch (16)	Catfish (18)
	Spiny eel (13)	Three spot gouramy (15)
	Frog (13)	Frog (15)
	Small shrimp (12)	Small shrimp (14)
	Rasbora (12)	Spiny eel (12)

The composition and number of important aquatic animals of the rich and poor groups are different. Poor group only has a maximum of 18 species while the rich group has 22 species at most. Some of the species that were not identified by the poor as important were *crab*, *catopra*, *snail*, *whisker sheatfish*, and *eel*.

There are also some differences between men and women in terms of the ranking of aquatic animals and also the composition. However both groups identified the snakehead as most important. Most of the species that men did not consider important were small species like *3-spot gourami*, *catopra*, *sheatfish*. Men consider frog as one of the most important but women rank it low although it was also included in the list.

Sources of Aquatic Animals

Aquatic animals in Angtasom village can be collected from several water bodies in the village especially during the rainy season. These common water bodies - lake, small stream, canal and rice fields - are the sources of aquatic animals in the village. All groups can go and collect aquatic animals from these sources. Aside from the community based water bodies, some individual or household managed aquatic systems are also sources of aquatic animals in the village. Trap ponds, ditch and household ponds are seasonal sources of aquatic animals. During dry season or after harvesting, trap ponds have a lot of aquatic animals. The villagers use household ponds and ditches during rainy season to trap and keep aquatic animals from the rice fields or from canals.

Gear Used

Fishing gear in the village is very common to the farmers that have aquatic systems and to those that are really collecting aquatic animals as their source of livelihood. Most of the fishing gears available in the village can be used by all groups. However some groups may lack some of these gears. From the seasonal calendar and species identification, the poor women and rich men listed a lot of aquatic animals which the poor men did not cite. The poor men group only use simple fishing gears like cast net, hook line, traps and gill net. Below are some of the common fishing gears being used in the village:

Handled pick out	- Use by poor men and women
Cast net	- Do not use by rich women
Hook long line	- Use by poor men and women
Jump trap	- Use only by poor men
<i>Chhib</i>	- Use by poor men and women
Gill net	- Use by all
Oblong trap	- Use by all
Drum trap	- Do not use by rich women
Scooping net	- Do not use by poor men
Dig	- Do not use by poor men and rich women
Lighting	- Use by all
Screen net	- Use by poor women
Catch by hand	- Do not used by rich women
Hard trap	- Used by rich men and women

Seasonality of Aquatic Animals

The presence and quantity of aquatic animals in the village depend on the season. The location of collection also varies depending on the season. The most abundant season for aquatic animals is during the beginning of the rainy season and at the end. During this period most of the aquatic animals are concentrated in shallow areas like in rice fields, shallow lake and trap ponds. Ditches and ponds are also being used during the rainy season.

For poor men most of the important aquatic animals are abundant during the month of November where aquatic animals can be collected from rice fields, lakes, and ditches. From April to October most of the aquatic animals are moderately abundant and can be collected from shallow areas. On the other hand, collection of aquatic animals can be done in deeper areas of the aquatic systems from December to March.

Trends of Aquatic Animals

The trend of important aquatic animals in the village is in a declining stage. Most of the aquatic animals are now very few and there is also some part of the year that the important aquatic animals are lacking. From the past (1960's) most of the aquatic animals are abundant in the village. During this period, people were very few and not so many fishermen were collecting aquatic animals. During the time of the civil war, most of the people were afraid to go out so natural water resources were not exploited.

It was in early 1993 when people started to intensify agriculture, resulting to a lot of negative impact on the aquatic systems. The use of chemicals and fertilizer destroyed the population of important aquatic animals. Aside from this, the increasing population also contributes to the decreasing trend of important aquatic animals. The demand for fish increases and since no one is really managing the resources, the population tends to continue decreasing. To be able to collect more aquatic animals both for their income and food, farmers are now using modern fishing gears.

Farmers' Meeting

After collating and translating the workshop outputs, the group had a brief discussion about the results, clarified some issues and/or contradictions in information. Feedback was taken from the villagers who participated in the workshop and also with some other farmers in the village. Additional activities were done during this period and unclear or vague information were further clarified with the villagers.

Annexes

Seasonal Calendar

Weather

Poor men

Apr Hot	May Hot, rain	June Hot	July Hot, a little rain	August Hot, rain	Sept As August	Oct As August	Nov As August	Dec As August	Jan Hot, windy	Feb Hot, some wind	Mar Hot
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Poor women

-Hot and rainy	Hot and rainy	Short drought, rainy	Short drought and rainy	Heavy rainy	Heavy rain	A little rain	A little rainy	Cold	Cold	Cold	Hot, unseasonal rain
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Rich men

-Hot	Hot, rain	Hot, rain	Rainy	Heavy rain	Heavy rain	Cold, rain	Cold	Cold	Cold	Quite hot	Hot
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Rich women

Hot	Hot	Hot	Hot and rainy	Heavy Rain	Rain, wind	Rainy windy	Rainy windy	Rainy windy	Hot and windy	Hot	Hot
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Social events

Poor men

April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Khmer New Year	Visakh Bochea	Ceremony praying asking for water	Start of Ceremony of rainy		Phchom Ben	Ceremony the end rainy	Kathanatie n	Harvesting ceremony	Harvesting ceremony	Meakh Bochea	Wedding ceremony

Poor women

Khmer New Year, Visakh Bochea,	Visakh Bochea	Praying Ceremony asking for water	Start of rainy season	Rainy season	Phchom Ben	Ceremony for the end rainy	Kathanatie, full moon and water ceremony	Harvesting ceremony	Flower ceremony	Meakh Bochea	Ceremony for offering to the dead
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Rich men

Khmer New Year, wedding ceremony	Visakh Bochea, Blessing the dead ceremony	Praying Ceremony asking for water, wedding	Start of rainy season	Phchom Ben	Phchom Ben	Kathanatien	Full moon – water ceremony	Wedding	Harvesting ceremony	Meak Bochea	Wedding ceremony and harvesting ceremony
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Rich women

Khmer New Year, wedding ceremony	Wedding ceremony, blessing the dead ceremony	Praying for rain ceremony	Start of rainy season		Phchom Ben	Kathanatien	Kathanatien	Harvesting ceremony	Wedding ceremony	Meahk Bochea	Harvesting ceremony, Wedding ceremony
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Health

Poor men

April	May	Jun	Jul	August	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Unhappy, fever	Normal	Normal	Normal	Happy	Happy	Happy	Unhappy, flu, fever	Normal	Normal	Normal	Unhappy, flu, fever

Poor women

Happy	Normal	Unhappy, Fever, cough	Normal	Normal	Normal	Normal	Unhappy, Flu	Unhappy, Stomach problems	Unhappy, Stomach problems	Happy	Happy
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Rich men

Stomach problems, flu dengue, typhoid	As April	As April	Fever, flu	Fever, flu	Fever, flu, until March	Fever, cold	Fever, cold	Fever, cold	Fever, cold	Fever, cold	Fever, cold
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Rich women

Unhappy High blood pressure, fever, typhoid	Normal	Normal	Normal	Normal	Normal	Normal	Fever, not happy	Not happy	Normal	Not happy	Not happy
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Migration

Poor men

April	May	Jun	Jul	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Go to PP and Thailand as construction worker	Go to PP and Thailand as construction worker				Come back from PP and Thailand	Come back from PP and Thailand	Come back from PP and Thailand	Come back from PP and Thailand		Go to PP and Thailand as construction worker	Go to PP and Thailand as construction worker

Poor women

	Go to Thailand and PP for earn money	Go to Thailand and PP for earn money	Go to Thailand and PP for earn money	Go to Phnom Penh for earn money						Came back from Phnom Penh	
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Rich women

Go to Phnom Penh as worker, go to Sre Am Bil to carry salt, and construction	As April									Go to Sre Am Bil and PP	Go to Phnom Penh and Sre Am Bil
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Rich men

	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money	Go to Thai border and other provinces to earn money
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Income/busy

Poor men

April	May	Jun	Jul	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Income				Busy	Busy			Busy	Busy	Income	Income

Poor women

			Busy with rice production	Busy with rice production	Busy with rice production		Busy harvesting	Busy harvesting	Busy harvesting	Busy harvesting, income from rice production	
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Rich men

				Busy with rice production	Busy with rice production		Busy with rice harvest	Busy with rice harvest	Income from rice	Income from rice	
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Rich women

				Busy with rice production	Busy with rice production		Income from rice and livestock	Income from rice and livestock	Income from rice and livestock		
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Aquatic Animal Identification and Scoring

Poor men small lake=small stream

Species	Characteristics						
	Easy to catch	Taste	Processing	Bones	Availability	Value	Consumption
Snakehead -in rice field, lake, small lake -used Handled pick out, Cast net, hook long line	4	3	2	1	3	3	2
Catfish -in rice field, small lake, lake -used jump trap, handled pick out, cast net, net	3	3	2	1	3	2	2
Three spot gourami in rice field, lake, small lake -used cast net, chhib (khmer), gill net	2	1	2	2	2	1	1
Spiny eel -in rice field, small lake, lake -used oblong trap, drum trap, hook line	1	2	2	1	3	2	2
Grey feather back	1	2	2	2	1	1	1
Yellow mystus	2	2	1	1	1	2	1
Climbing perch	3	3	2	1	3	2	2
Mystus	1	1	1	1	2	2	1
Whisker sheatfish	2	2	1	1	1	1	2
Small shrimp	3	2	1	0	3	1	2
Rasbora	1	2	2	2	2	1	2
Freshwater eel	1	2	1	1	2	2	1
Catopra	1	2	1	1	1	1	2
Snake	1	1	0	2	1	2	1
Frog	3	2	1	1	3	2	1
Snail	2	1	0	0	3	0	2
Crab	2	2	1	0	3	0	2
Toad (roughskin frog)	2	1	1	1	2	1	2

Poor women

Species	Characteristics						
	Availability	Taste	Easy to catch	Bones	Processing	Value	Consumption
V8pw							
Snakehead -in rice field, lake, small lake -used cast net, handled pick out, hook long line	5	4	3		2	3	1
Catfish -in rice field, lake, small lake -used gill net, dry up, cast net, hook long line	5	6	2		2	3	1
Climbing perch -in rice field -used gill net, oblong trap, handled pick out, scooping, dry up	6	4	3	2	2	2	1
Mystus -in trap pond, lake, small lake -used oblong trap, chhib (khmer), cast net.	1	2	1		1	1	2
Rasbora -in rice field, lake, small lake -used oblong trap, cast net, drum trap	2	1	2	2	1	1	1
Three-spot gourami -in rice field, lake, small lake, trap pond -used oblong trap, drum trap, cast net	6	2	2	0	2	1	2
spiny eel -in rice field, lake, small lake, trap pond -used chhib(khmer), oblong trap, drum trap	3	2	2		2	2	1
Small shrimp -in rice field, lake, small lake -used oblong trap, drum trap, chhib(khmer)	5	2	2		2	2	1
Wrestling half beak -in lake, small lake -used oblong trap, drum trap, chhib(khmer)	2	2	2	0	0	1	2
Frog -in rice field, lake, sml lake -used dig, lighting, drum trap, hook long line	3	3	2	0	2	3	2
Blackline gourami -in rice field -used chhib(khmer), screen net	3	1	2		3	1	1
Pygmy gourami -in rice field, lake, small lake -used oblong trap, drum trap	2	1	1		1	1	1
Eel	1	1	1		1	1	1
Crab -in rice field, lake, small lake -used hook line, catch by hand, oblong trap	2	1	1	1	1	1	1
Snail -in rice field, lake, small lake -used scooping, catch by hand	2	1	1		1	1	1
Freshwater clam -in rice field, lake, small lake, canal -used cast net, catch by hand, scooping	2	1	1		1	1	2
Snake -in rice field, forest -used hook line, dig, catch by hand	2	1	2	2	2	1	1

Rich men

Species	Criteria				
	Availability	Easy to catch	Value	Processing	Consumption
Snakehead In lake, line and gill net, lighting, trap pond, hard trap, catch net,	5	3	7	4	4
Catfish In rice field, ditch, lake, use trap net, cast net, oblong trap, trap pond, lighting,	5	3	5	3	4
Climbing Perch As above	5	3	5	4	4
Spiny eel Ditch, lake, oblong trap, trap pond, hook,	2	1	5	3	1
Rasbora In rice field, ditch, oblong trap, gill net, cast net, trap pond	4	3	1	1	4
Small shrimp In ditch, in lake, oblong trap, scoop net	4	3	2	2	4
Mystus In lake, rice field, cast net, oblong trap, trap pond	2	1	1	1	
Catopra In rice field, lake, trap pond, gill net, oblong trap, cast net	1	1	3	3	
Three spot gourami In lake, ditch, gill nets, oblong traps, cast net	2	1	1	2	1
Eel In ditch, in lake, lighting, line, oblong trap, eel trap	2	1	2	1	
Whisker feather fish Ditch, trap pond, oblong trap, cast net, trap net	1	1	3	2	
Frog In rice field, lake, lighting, line, oblong trap, drum trap	4	3	3	1	2
Pygmy gourami In lake, rice field, oblong trap, scoop net	3	3	1	1	3
Grey featherback In ditch, trap pond, oblong trap, cast net,	1	1	2	2	
Yellow mystus In rice field, lake, trap pond, lighting, hook long line, line, cast net	1	1	2	2	
Crab Rice field, dig,	3	3	1	1	4
Snail, and river snail Rice field, ditch, community pond, catch by hand	4	3	1		4
Snake In rice field, ditch, oblong trap, gill net, stick	2	1	0		

Rich women

Species	Criteria							
	Catching description	H. Value	Availability	Processing	Taste	Easy to catch	Family consumption	As animal feed
Catfish	Hard trap, in rice field	7	5	2	2	1	1	
Three-spot gourami	In lake, scoop net,	2	1	1	2		1	
Rasbora (local name)	Rice field, oblong trap	2		2	2	2	2	1
Mystus	In rice field, gill net	3	1	1	2	1	1	
Spiny eel	In rice field, oblong trap	2	4		2	1	1	
Climbing perch	Rice field, oblong trap	3	1		2	2		
Small shrimp	In lake, scoop net	1	1	1	1	2	1	1
Silver rasbora	Rice field, oblong trap	1	1	1				
Crab	Rice field, hole,	2	1	1	2	3	2	1
Eel	Ditch, eel trap	2	3	2	1	1	1	
Snakehead	Rice field, gill net,	4	5	3	2	5		
Catopra	Lake, line	2	2	2	2	2	2	1
Snail	Rice field	2	1	1				
Whisker sheatfish	Rice field, oblong trap	2	2	2	2	1	2	
Yellow mystus	Ditch, gill net	1	3		2			
Pygmy gourami	Lake, scoop net	1	1	3		1		
Frog	Rice field, lighting	6	3	1	3	2	3	
Snake	Rice field	1	3	1				
Iridescent glassy perchlet	Lake, scoop net		2	2				
Wrestling half beak	Ditch, scoop net,		2					
Rasbora [check with villagers]	Ditch, scoop net	2	2					
Grey featherback	Ditch, gill net			1				

Seasonality of Aquatic Animals

Poor men

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead, hard trap, cast net, trap net, line, in rice field, ditch, lake,	As previous	Moderate, hook line, line, cast net, in lake, canal, small stream	As previous	As previous	As previous	As previous	As previous	Abundant, gill net, hook line, cast net, trap net, jump trap, in rice field, lake	Scarce, dry trap pond, spawning in ditch, lake, canal, rice field has a lot of grass, trap net, cast net (as previous)	As previous	Scarce, dry trap pond, canal, ditch, lake, trap net, cast net	As previous
Catfish, cast net, trap net, hard trap, gill net, line, jump trap, in lake, and reservoir, ditch and rice field	As previous	As above	As previous	As previous	As previous	As previous	As previous	Abundant, gill net, cast net, trap net, in rice field, lake and ditch	Spawning in lake, ditch, trap pond, all these were deep (as previous)	As previous	Scarce, dry trap pond, ditch, canal, lake, small stream	As previous
Climbing Perch, gill net, cast net, line, in reservoir, rice field, lake	As previous	Moderate, line, cast net, gill net, trap net, rice field, lake, ditch	As previous	As previous	As previous	As previous	As previous	Abundant, gill net, hook long line, trap net, line, cast net, in ditch and lake	Spawning in rice field, (as previous)	As previous	Scarce, dry trap pond, canal, ditch (As previous)	As previous
Frog, lighting, hard trap, stick, (to kill) rice field	As previous	Abundant, use lighting, hard trap, line in rice field, ditch, lake	As previous	As previous	As previous	As previous	As previous	Moderate, drum trap, oblong trap, rice field,	As previous	As previous	Scarce, dig, hook, hole, in lake and ditch	As previous
Spiny eel, cast net, hook, oblong trap, in rice field, ditch, small stream and lake	As previous	As previous	As previous	As previous	As previous	As previous	As previous	Abundant, oblong trap, scoop net, cast net, hook, dry rice field	As previous	As previous	Scarce, dry ditch, hook, in reservoir and lake	As previous
Small shrimp, scoop net, oblong trap, rice field, lake								Abundant, oblong trap, scoop net, dry lake, rice field, reservoir	As previous	As previous	Moderate, scoop net, oblong trap, dry	As previous

Poor women

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Climbing perch	Scarce, dry trap pond, ditch,	As previous	Moderate, in rice field, lake, small stream, canal, scoop net, bamboo net, oblong trap	As Previous	As previous	As previous	Abundant, in rice field, lake, ditch, canal, use hard trap, scoop net, bamboo net, gill net, trap net	As previous	As previous	As previous	Scarce, in lake and ditch	As previous
Catfish	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above
Snakehead	Moderate, as above	Moderate, as above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above
Frog	Scarce, in rice field, lake, line, hook,	As previous	Abundant, rice field, lake, ditch, trap pond, use hard trap, drum trap, lighting	As previous	As previous	As previous	Abundant, in lake, ditch, rice field, use line, drum trap	As previous	As previous	As previous	Scarce, in rice field and lake	As previous
Small shrimp	Abundant, in lake, ditch, small stream, use scoop net, bamboo net, oblong trap, drum trap	As previous	As previous	Abundant, lake, trap pond, small stream, use oblong trap, drum trap, scoop net	As previous	As previous	As previous	As previous	As previous	As previous	Scarce, lake, ditch, trap pond	As previous
Spiny eel	Scarce, trap pond, lake, small stream, use oblong trap, drum trap and scoop net	As previous	As previous	As previous	Less abundant, in rice field, in lake, small stream, canal, use drum trap, oblong trap, sccop net, bamboo net	As previous	As previous	As previous	As previous	Scarce, in lake, ditch, small stream, use line, oblong trap, drum trap, scoop net	As previous	As previous

Rich men

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Moderate, ditch, lake, cast net, gill net, trap net, hard trap, pump draining	As April	As April	As April	Abundant, rice field, gill net, line, hook long line	As August	As August plus, jump trap, lighting	As October	Abundant, in ditch, lake, cast net, trap net, gill net, hard trap, draining	As December	As December	As December
Catfish	As above	As April	As April	As April	As above	As above, but moderate	As above	As above	As above	As above, but moderate	As January	As January
Climbing perch	As Catfish above	Above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above
Spiny eel	Nothing	Nothing	Nothing	Moderate, rice field, oblong trap	As July	As July	As July	Abundant, as July	As November	Nothing	Nothing	Nothing
Rasbora	Moderate, in ditch, in lake, use scoop net	As April	As April	Abundant, RF, canal, oblong trap	As July	As July	As July, catch by hand	As October	As July	Moderate, in ditch, lake, scoop net	As January	As January
Small Shrimp	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above

Rich women

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Scarce, in ditch, with gill net, cast net, hard trap	As for April	as April	As April	As April	As April	As April	Abundant, in rice field, ditch, Jump trap, hook long line, gill net line	As for November	Moderate, in ditch, canal, hook long line, cast net, hard trap	As for January	As for January
Catfish	All As the month above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above
Frog	Less abundant rice field	As April	As April	As April	As April	Abundant, in rice field, hard trap, lighting, line	As September	As September	Scarce, in rice field	As December	As December	As December
Catopra	Scarce, in ditch, with gill net	As previous	As previous	As previous	As previous	As previous	As previous	Abundant, in ditch, canal, line, gill net, scoop net	As November	As November	Scarce, in ditch, use gill net	As February
Crab	Scarce, ditch, rice field	As previous	As previous	As previous	As previous	Abundant, rice field, hook, dig, oblong trap, gill net	As September	As September	Scarce, ditch, rice field	As December	As December	As December
Whisker sheatfis	Scarce, ditch, gill net	As previous	As previous	As previous	As previous	Abundant, in canal, rice field, scoop net, oblong trap, gill net	As September	As September	Scarce, ditch, small stream, gill net	As previous	As previous	As previous

Small stream = part of the lake / small water inflow/outflow

Trends of Aquatic Animals

(V8) (this village only had a reservoir, not a lake, so where it says lake, it means “reservoir”)

Poor woman

Species	1960	1970	1975	1993	2001
Climbing perch	Abundant, Low human population, use traditional gear, wide flood plain for fish spawning, lake was deep	Abundant, civil war, low human population, lake was deep, and wide flood plain for fish spawning	Abundant, Pol Pot regime, no fishermen, very abundant fish, Communal lifestyle	Abundant, low human population, used traditional gear	Declining year after year, high human population, more fishermen, use modern gear, people cleared the land of the water plants for agricultural use of the land
Catfish	As above	As above	As above	As above	As above
Snakehead	As above	As above	As above	As above	As above
Frog	As above	As above	As above	As above	Moderate, high human population, more fishermen, lake was shallow
Small shrimp	As above	As above	As above	As above	As above
Spiny eel	As above	As above	As above	As above	As above, cleared the land of water plants

Poor men

Species	1960	1970	1975	1993	2001
Snakehead	Abundant, low human population, more flood plain, irregular rain, traditional gear, spawning in the flood plain	Abundant, low human population, No fishermen... civil war, bombing by US, ((Lon nol regime) fish spawning in flood plain	Pol pot regime. Abundant, limited fishermen, not may people allowed to fish. Lake was deep, wide flood plains good for fish spawning	Scarce, national election, high human population, more fishermen, modern gear use, no flood plain for fish spawning, water is shallow	As previous
Catfish	As Above	As above	As above	Scarce, fish disease, bombing	Scarce, high human population, over fishing, lake is shallow, no flood plain for fish spawning
Climbing Perch	As above	As above	As above	Scarce, high human population, use modern gear, water is shallow, no flood plain	As previous
Frog	As above	As above	As above	As above	As previous
Spiny eel		As above	As above	A above	As previous
Small shrimp	Abundant, Easy to collect	As previous	As previous	Moderate, high human population,	As previous

Rich man

Species	1950	1960	1975	1975-1979	1979-2001
Snakehead	Abundant, in rice field, ditch, lake, all of these were deep, few fishermen, fish spawning in RF and lake bamboo net, oblong trap, small oblong trap drum trap	Moderate, in rice field, in ditch, in lake, ditch and lake were more shallow, more fishermen, cast net, feed trap, bamboo net, oblong trap, small oblong trap, drum trap	As previous	Abundant, Pol Pot regime, only a few fishermen allowed to fish for the community	Scarce, ditch, lake, all shallow, fishermen, modern gear, electro fishing, trap net, gill net, cast net, scoop net, dai (stationary trawl net), hard trap, line, catch in RF, lake, reservoir
Catfish	As above	As above	As above	As above	Moderate, as above
Climbing perch	As above	As above	As above	As above	As above
Spiny eel	As above	As above	As above	As above	As above
Rasbora	As above	As above	As above	As above	As above
Small shrimp	As above	As above	As above	As above	As above

Rich woman

Species	1950-1963	1963-1970	1970-1975	1975-1979	1979-1990	1990-2001
Snakehead	Abundant, in ditch, ditch, ditch is small and shallow, use hard trap, spear	Abundant, RF, hard trap, spear, fish agitator	As previous	Abundant, trap net, in rice field and canal and ditch	Declining, in ditch, rice field, use gill net, cast net, line, hard trap, scoop net	As previous
Catfish	As above	As above	As above	As above	As above	As above
Frog	Abundant, rice field, lighting, line, drum trap, oblong trap	As previous	As previous	As previous	Declining	Scarce
Catopra	Abundant, ditch, small stream, gill net, draining trap pond	As previous	As previous	As previous	Declining yearly, in ditch, small stream	Scarce, gill net, ditch small stream, drain trap pond, eaten by ducks
Crab	Abundant, ditch, rice field, hook, oblong trap	As previous	As previous	As previous	Declining yearly, in lake, ditch, small stream	Scarce, eaten by ducks!