

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

Participatory Rural Appraisal in Svay Cheak Case Study 2 (PRA Report from 2001)



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Svay Cheak 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. In any development organization and even to 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 data 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 have been started in different villages in Cambodia. However, there appears to be 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. Thus, the communities are left to accept and accommodate the said "intervention". It is therefore necessary to listen to the villagers and to consult them 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 this main objective 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 accomplished in three days, which also included the collection of secondary information about the province and the commune (see Table below). On the first day, the district and commune offices were visited to get secondary data. This information helped the team in identifying the village for this study.

Before the village was finally selected, validation and additional information were asked from the head of the commune. Visitation of the village was also done during the first day to also introduce the team to the villagers. On the second day, the village profile was generated and participants for the next day's activity were identified. The third and final day was used for generating more information about the village and getting the different perceptions among gender regarding the village and aquatic resource in particular. A short summary of activities and a presentation of output were also done.

Table 1 Schedule of PRA Activities in Svay Cheak Village

Dates	Activities
07 May 2001	Collection of secondary information
08 May 2001	Introduction to the village Community profiling
09 May 2001	PRA workshop Feedbacking

Svay Rieng Province Province Description

Location. Svay Rieng is situated 124 km away from Phnom Penh in the southeast part of Cambodia. It covers a land area of 2,966 km².

Boundaries:

- North - Kampong Cham province
- South - Long Anh province of Vietnam
- East - Tha Ninh province of Vietnam
- West - Prey Veng province

Administration and population. The province is composed of seven (7) districts with 80 communes and 690 villages. In 1998, the estimated population of the province is 442, 000 with an average 149 persons per sq. km. (Census, 1998)

Land use. A large portion of the land is being used for rice production. Based on information from the office of the Provincial Department of Agriculture, Forestry and Fisheries, 68% of the land area is used for rice cultivation, 5% for the settlement, 3% for streams or *prek* and only 4% is flooded area. In areas close to the water bodies, farmers can grow dry season rice. Below is a table showing the different uses of land in the different districts of the province.

Table 2 Distribution of Land use in Svay Rieng province

District	Total area (Ha)	Land use (Ha)							
		Riceland	Cropland	Hill area	Forest area	Homestead	Water area	Flooded area(Free)	Road area
-Romeas Hek	78,460	35,460	315	929	37,776	2,160	670	-	1,150
Svay Chrum	57,570	48,889.87	111.75	1,359.94	45.69	4,037.68	1,483.88	141	1,500.19
-Romduol	28,990	22,262.98	-	2,153.88	2,038	1,505	468.85	267.85	297
-Svay Teap	46,467.44	39,170.93	857.60	590	73	1,728.91	2,396	1,412.40	238.60
-Chan Trea	42,777	20,036.31	-	1,171.17	865	4,937.12	3,527.90	10,386.78	1,852.73
-Kampong Ro	40,980	33,509.04	141.77	2,179.10	-	1,759.77	536.40	2,528.88	325.04
-Svay Rieng	1,395.56	748.97	19.36	40.74	182.19	185.19	121.85	2	95.26
Total	296,640	200,078.10	1,445.48	8,423.83	40,979.88	16,313.67	9,204.88	14,738.34	5,455.82

Source: Provincial Department of Agriculture, forestry and fisheries.

Although the total land area for rice cultivation is large, the production level in the province is still low. One of the reasons for this is that the soil quality in this province is poor, as reported by Tana in 1993. There are four different types of soil in the province: infertile sandy soil, sandy, silty, and acidic soil. However the quality of the soil in the province is now deteriorating, resulting to the low production of rice.

Livelihoods. In general, the livelihoods in Svay Rieng province is not so varied. In spite of the poor soil quality and the existing water problem, majority of the residents in this province still depend on the production of rice. However the trend of migration in the province to the capital is increasing particularly among the young men and women. Majority of those who migrate to the capital would work in construction sites (for men) and in garment factories (women).

Sources of income. According to the Planning office of the Provincial Department of Agriculture, Forestry and Fisheries, the source of income of the residents in the province can be classified into three type/categories:

- Economic source 1: Income from agricultural production (90%)
- Economic source 2: Income from general service (7%)
- Economic source 3: Income from industry and handicraft (3%)

Resources. The water resources in the whole province are abundant particularly during the rainy season. However, the aquatic animals or wild fisheries are still limited in the area since there is no permanent water source or body. During the early years, the size of catch from capture fisheries would be enough for the requirements of the province. But at present, this quantity is no longer meeting the demand in the province. The following are the main factors causing the decline of capture fisheries in the province:

- Over fishing
- Use of destructive fishing gear or method
- Environment changes
- Loss of habitat

The main water bodies in Svay Rieng Province are the following:

- Tonle Tyko - situated in Svay Rieng and Romdoul districts
- Tonle Kampong Trach - situated in Romeas Hek district

Beung Tathat	-	situated in Svay Chrum district
Prek Prasout	-	situated in Svay Teap district
Beung Doun Toy	-	situated in Chan Trea district
Beung Khset	-	situated in Kampong Ro district
Beung Bekchan	-	situated in Kampong Ro district
Beung Prek Thnot	-	situated in Svay Chrum district

Aside from the different water bodies mentioned above, there are still smaller water bodies that also provide aquatic animals to the people in the province. Moreover the different aquatic systems in the province have multiple purposes to the farmers. Some farmers use water from the small lake for their crop and their livestock. Other households use the water for domestic use. Below are the small water bodies in the province:

Small lake	-	Trapiang
Streams	-	Oo
Canals	-	Pralai
Refuges	-	
Pond	-	Sra
Ditches	-	Hao
Trap ponds	-	Dier

Kampong Ro

District Description

General information. Kampong Ro is one of the districts in Svay Rieng province, which is situated in the southern part of the province and close to the border of Vietnam. The district has a total land coverage of 41,492 hectares. This district is composed of 12 communes and the number of villages in each commune ranges from 4 to 14. The whole district has a total of 89 villages. Among the 12 communes, 4 of these are flooded every year.

Population. It is estimated that the district has a total of 63,494 residents with an average percentage of women of 52.60%. There are about 13,489 households in the villages, which are divided into 778 groups. The average household size in the village is 4.7 head/family (*District office of Kampong Ro, 2001*).

Water bodies. There are a number of water bodies in the district that serve as sources of aquatic animals in the district. Below are the main water bodies located in the district:

Boeung Chop Pring in Thmei commune
Prek Kampong rotes in Bang Taykrang commune
Boeung Khset in Khset commune
Ou Kampong Ro in the district center
Boeung Bekchan in Gner commune

Aside from the water bodies mentioned above, trap ponds in the village are also considered as another source of wild fisheries in the district especially during the cold

season. In general, trap ponds are in the lake but there are some located in rice fields and near homestead also.

Land use. Majority of the households here are farmers thereby the main use of land is for cultivating rice. Below is the division of land according to usage:

Rice land	-	30,972.56 ha
Forest land	-	38.31 ha
New grown forest	-	10.50 ha
Water area	-	2,950.64 ha
Irrigation area	-	789.62 ha

Sources of income. Aside from rice cultivation, residents from this district also get income from other sources. Livestock is considered as another main source of income. Vegetable growing and making mats also contribute to the income of the families. Some families also work outside the village to gain more income. Phnom Penh is the most common place where residents in this district go for work. Women usually work in garment factories and men work in construction sites. People who work outside the village return to their communities during the planting season.

Food supply. In general the food supply in some parts of the district is not enough due to regular flooding during the rainy season. However production in agriculture increased compared to the previous year.

Status of culture/wild fish. Kampong Ro district is considered as a medium rich in wild fisheries. This is due to some parts of the province that are low and with water, which serve as a good habitat for wild aquatic animals. An organization known as "Food for the World" assisted the district in teaching people how to culture fish. Majority of the communes in this district are into fish culture for their own consumption. Species like catfish, pangasius and Tilapia are the common species being cultured and the seeds come from Vietnam. However there are still problems in terms of technical knowledge on how to culture these species properly. Thus the number of families culturing fish decreased.

Species of wild aquatic animals are still abundant in this district particularly in three communes. Big fishes like snakehead, catfish and climbing perch dominate the district market and command a higher price.

Commune Description

General description. Samlay commune is one of the lower areas in the district, close to the river and experiences regular flooding every year. This commune was also classified as one of the poorest or low-income commune. This commune is composed of 8 villages, three of which are considered the lowest in terms of topography. They are Tapor, Svay Cheak, and Samlay Tiang. The food supply in the commune is generally not sufficient for the whole year. The level of rice production is very low due to regular flooding during the rainy season.

Samlay Commune is composed of eight (8) villages as followed:

1-Svay Cheak	131 families
2- Svay	168 families
3- Prey Manouse	190 families
4- Samlay Tbong	144 families
5- Samlay Tiang	165 families
6- Tapor	200 families
7- Prey Phniat	229 families
8- Prey Pha ave	148 families

Land use. The main use of land in the commune is for rice cultivation, with an approximate area of 3,660 hectares. The lake and embankment occupy a total of 677 hectares.

Major crops. Although regularly experiencing flooding, the main product in the commune is still rice. Other crops and vegetables are also being cultivated in this area.

Sources of income. Aside from rice farming, growing livestock is also considered as another source of income. And with the land being a low-lying area and close to the big river, an estimated 30% of the residents in this commune count fishing as their main source of income. A small percentage of the villagers get income from small business and trading.

Wild fish. The wild fish species play a very important role in the commune, with 30% of the population getting their income from fishing. During the rainy season fishermen collect young aquatic animals and stock in their household ponds and ditches. Some farmers culture other fish to attract wild fish enter into their systems.

Selection Process for the Village

The selection of the village was done by drawing a transect line through the province from the northwest down to the southeast. By doing this, the line would transect through three different topographies of the province: the higher area in the northwest, midland and the lower area in the southeast. A district was first identified in each topography level. Three districts were identified in this province namely Chantrea, Kampong Ro and Ramdoul.

Names of the communes situated close to or along the transect line were then listed down, one commune in each piece of paper. The staff then randomly selected the possible commune for study by randomly picking a paper from the pot with all the pieces of paper with the names of the different communes. Second and third communes were also picked as possible replacements if the first commune would not be possible.

After the commune had already been identified, the team visited the place for clarification purposes. Additional secondary data about the commune and its different villages were also acquired. The village was then identified using the following criteria: the aquatic resources in the area, the economic level of the village and also its population. The village was also selected since it represents a midland community in the lower area of the province and for its closeness to the river.

Specific Methods Used

Village (Resource) Map - Mapping of the resources was done 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 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 exercise 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 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 the importance of each aquatic animal 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 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 in number of a particular aquatic animal were also analyzed.

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. Information about the present resources in the village was generated using the village mapping exercise, 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. Individual names were written down in cards and farmers/key informants used these to identify the different social groupings in the village. Using the result of this activity, participants for the next day's activity were selected. Two groups of farmers representing the poor and better off household were selected. The team then set an appointment with the selected people to participate in the activity for the next day.

The second day's activity generated more detailed information about the activities in the village and how different social groups differ in their ideas. For this activity, 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 gathered 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 a summary of the important issues. A very short feedback session was done about the activities that were conducted in the village for the past two days.

Setting the Context

Mapping the Current Resources in the Village

The village represents lowland area in this district. Thus the water resources are abundant in this village. Aside from water resource, land and some other physical resources are also present in the area. Below are the resources identified by the villagers during the PRA exercise when the village headman and some key informants discussed and drew the village map (please refer to Figure 1).

Land resources. Majority of the land in the village is being used for agricultural activities. Being one of the major economic activities (rice cultivation) of the village, almost everybody in the village own a small parcel of land for cultivation. However, the land can only be used in one season. Even if the area is low, almost the entire area dries up during the dry season. Thus, cropping is not possible.

Water resources. Water resource in the village becomes abundant in certain periods of the year. This is during the rainy season where majority of the area is with water. The lake becomes larger during the rainy season. Agricultural activities commence when rain comes and when the lake has water. Rice cultivation and fishing all depend on the lake located in the western part of the village. Aside from the lake, which serves as a community water body, ditches (*hao*), small lake, also known as, swamp (*Trapiang*), and trap ponds (*dier*) are some water resource that villagers can utilize.

Aside from the land and water resources, basic services also exist but not sufficient. Wells in different locations in the village have been installed. There are also small shops around the village where farmers can purchase their basic needs.

Mapping the Development in the Village

The development of the village was discussed during the timeline exercise participated in by some old people from the village and also with young villagers. The discussion started with the date when the village was established. However, the date of establishment of the village (which was in 1938) was not included in the diagram. Before, the village was originally joined with six other villages, altogether called Ram

village (1817). The big village was then divided into two villages where one is named Tapir and the other is Svay Cheak.

The purpose of the timeline activity was to understand the development history of the village. However since majority of the participants are old, a great portion of the discussion focused on political issues and how they have suffered during the different regimes (Lon nol, Polpot and the Khmer Rouge).

During the early days when the village was still young, there were very few households in the village (46 households). Resources in the village were abundant and most of the villagers get income from rice production and fishing. During the Lon nol regime in 1956 the farming situation was very difficult because farmers' houses were burned and there were a lot of bombings. This problem aggravated the poverty condition in the village. This situation lasted for several years (until 1975). People did not have enough food, medicine and also water supply for their farmland. The situation worsened when the Polpot people forced the villagers to do hard labor for them. During this time, people could not farm in their own land due to the land mines in the field.

In 1960 wild aquatic resources were abundant in the village and farmers used simple gears to collect big fishes and other aquatic animals. Even during the low and hard times in the village, the aquatic resources were not affected so much. Few fishermen collected aquatic animals during that time so the species were abundant. Between the periods of 1995 and 2001 some non-government organizations started working in the village and introduced fish culture in ponds. However, the number of farmers culturing fish in the village decreased due to the lack of knowledge about fish culture.

In terms of the condition of the farmers, they started to improve in the year 1985 when different form of support came into the village. Rice production started to increase and the food supply is enough. In 1995 - 2001, farmers started to use chemical fertilizers in for their agricultural activities.

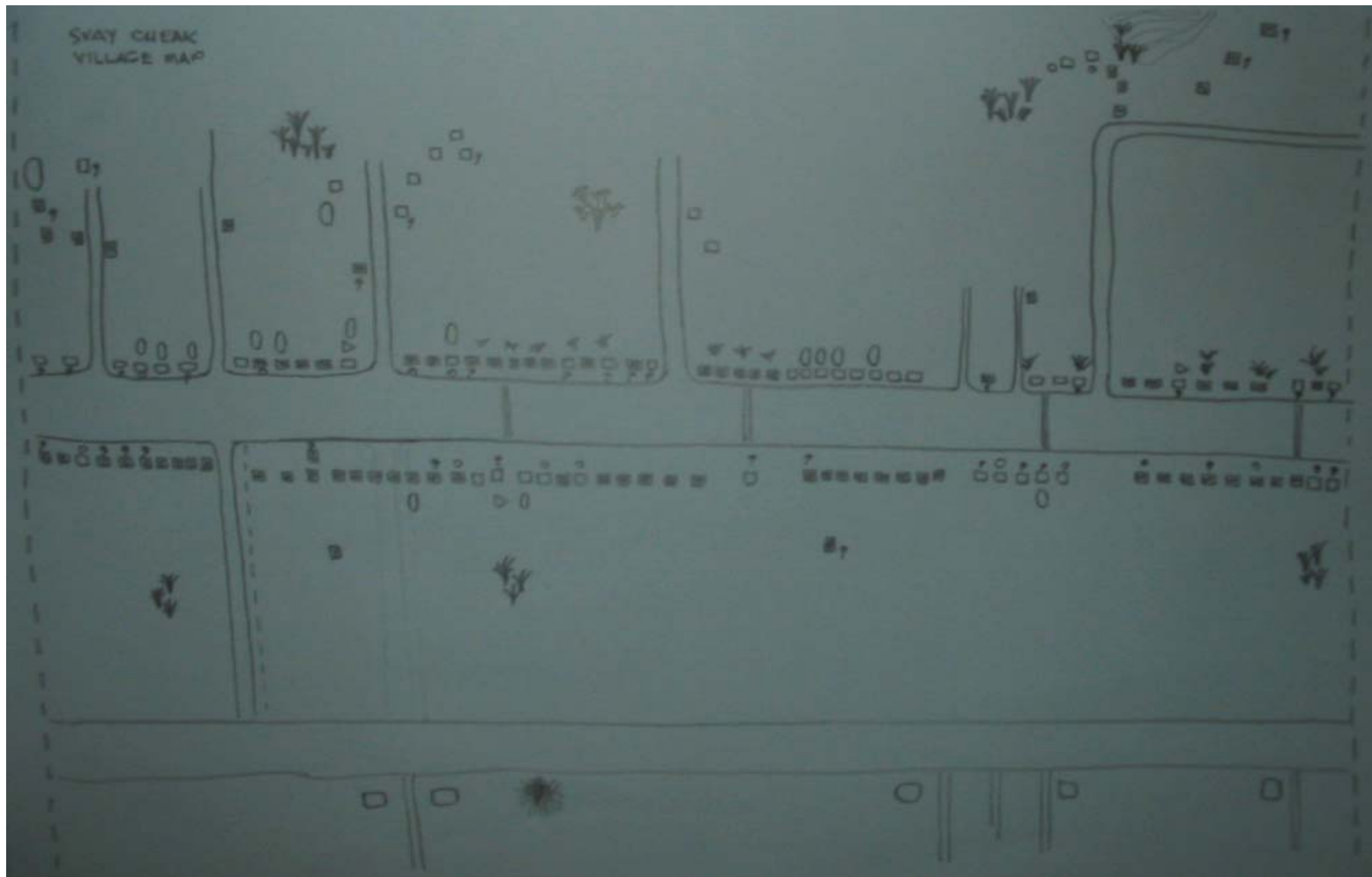


Figure 1 Village Map of Svay Cheak

Figure 2 Development Timeline of Svay Cheak Village

Year	Events
1956	French regime, bombing (several bombings) People with row form houses, were burned; people got injured; difficulty in rice production
1959	People are poor; small number of households
1960	Wild fish is abundant, used small-scale fishing gear such as line, gill net and hard trap. snakehead and big snakehead are available
1965-70	Giak kong soldier crosses the village to Chantrea district and stayed at household of the village, no violence to people People lacked food, experienced low rice yield, not enough rain, people got cholera especially children, no medicine; used traditional medicine; no school but had a school in another village (TAPAU)
1970-75	Bombing in TAPau Pagoda; killed livestock destroyed the houses. In 1972 Theavki soldier eliminated Giak Kong one person was killed. People were poor and they didn't do rice production. People ran to hide in neighboring villages. Women were assaulted and raped by Theavki soldiers. Killed buffalo for food, People left the village. People difficult to access fish because they afraid of bombing not enough food. People agree to build the school from bamboo with the leaf. Teachers were volunteers. Many diseases like fever (childrent)
1975-79	Pol Pot forced people into hard labor, killed almost all people. In 1976 created the commune and people have the food together in the village. More diseases especially among children. Mining in the rice field and roads by Giak Kong so that to hinder the Theavkis.
1979	Came to the village; no household and a lot of mine in the village. Livestock killed by mine during plowing. No livestock and equipment for rice production
1980-85	Livestock had been killed by mine during plowing. No livestock and equipment for rice production. Fish supply was abundant (less fishermen). Relocated the school to TAPAU village
1985-90	Living standard was moderate; enough food, have one well in the village. Created health center in the Samley commune. Reduced rice fields
1990-95	In 1993 election, introduced UNTAC. A lot of insects destroyed rice Livestock had disease (treatment by private vet)
1995-2001	In 1996 CMAC came to help. People have enough food Have NGO for village development. People doing fish culture in three ponds. Using pesticide and chemical fertilizer for agriculture purpose. More livestock raising and a lot of wells for each household

Mapping Social Context of the Village

One of the reasons for selecting this village is its economic ranking that is a representative of a low-income community. Livelihood in this village is very limited and the main source of income is farming only. The far distance to the town and province proper is another contributing factor why the village is not progressive.

Although relatively poor, the village cannot be considered as homogeneous. Some families still have a relative advantage over other families. The sources of income in the village is not the same with all families therefore the economic status is also not the same. During the well being ranking exercise, the farmers identified six (6) socio-economic groupings in the village. Farmers used their own criteria in ranking and grouping families in the village (see Table 3).

Socio-Economic Characteristics

Land. Ownership and area of land were also used to determine the well being of the villagers, specifically the farmers in this village. Based on the exercise done in this village, the resource-poor or the lower income level families usually own a small piece of land while a few do not have land at all. On the average, families own 0.5 - 1 hectare of land. The middle to rich group would own at least 1 hectare of land. Most of the families in this group get to own large tracts of land either as an inheritance from the family or bought from other farmers.

Livestock. The number and type of livestock were also used in identifying the well being of the farmers in the village. The lowest or poorest households in the village do not have any livestock. If they do, they would only have at the most two heads of livestock, sometimes given to them by other farmers as payment for taking care of their livestock.

Food availability. It is very common among families belonging to the lower group in the village not to have enough food for the year. Scarcity of food is experienced during the months prior to rice harvest or during the middle of cultivation when food in stock had been consumed. Some farmers in the poor group also do not have the capacity to stock food. The rich farmers belonging to the third to the sixth groups get enough food from their production that they can also sell some of it to other farmers.

Source of income. Since their resources are limited, poor families' main source of income is working as laborers for other farmers within and even from outside their village. Other farmers also get income from fishing. On the other hand, the middle and rich group who have rice fields to cultivate, get a large part of their income from rice production. They also have other sources of income like income from services, trading and other off- farm work (i.e. as factory workers).

Transport. The most common transport in the village is the motorbike and bicycles. Farmers in this village cannot afford to have expensive forms of transport like cars. In the poor group some do not have any kind of transport at all. However there are a few farmers in the group that have bicycles as their transport. On the other hand, the rich group would have

both a bicycle and a motorbike. Farmers also use their motorbikes for other income-generating activities.

House. The size and the condition of the house were also used in well being ranking. In most cases, farmers in the lowest income group have houses made from simple materials like leaves and grass. They are small and with roofs made from cogon grass or leave from the palm tree. For the rich the most common roofing materials they use are tile and metal roofing. The houses of middle to rich families are big and usually two-level structures.

Other assets. Appliances and other equipment for rice cultivation and fishing were also used in the well bring classification. Rice mills, generators, fishing gear, ploughs and the like are the different assets owned by rich families. Some of these assets are also used to gain income like the generator and rice mills. On the other hand, the poor households or farmers do not own most of these assets.

Table 3 Well-being Ranking in Svay Cheak Village

Rank	Group of women	Couple
I	No land for agriculture Work as helper House made from leaves No cow or buffalo Not enough food for the year Mainly fishing	Very poor Houses made from leaves Own land of 0.5 hectares Income from fishing worker Own bicycle
II	Own field of 70A (7000m ²) Not all have livestock Family member: 5 - 7 members Food is only enough for 6 months Normally go fishing and make mats for income Work as helper Few have bicycle	House made from leaves Have few livestock (2 buffalo) Own land of 0.5 - 1.5 hectares Income from fishing Work as helper
III	Majority have livestock (6 - 10 heads) Own land (2 hectares) Can used enough fertilizer Sources of income are fishing, construction, and garment factory House made from leaves At least 70% have bicycle	House made from leaves and metal Own motorbike & bicycle With average livestock of 2 - 4 heads Own rice fields from 1.5 - 2 hectares Income from fishing, livestock & motor taxi Work as helper
IV	Household member (4-2 persons) Have livestock Own land (2 - 2.5 hectares) High rice production Can use fertilizer Have motorbike and bicycle Middlemen Majority have good houses made from concrete Have appliances (TV, radio, etc)	House with tile and metal roofs Own bicycle and some with motorbikes Livestock average of 3-4 heads Land own - 2 hectares on average Income from livestock, fishing and motor taxi

V	Household member (3 - 5 persons) Have livestock (3 heads) Enough food for whole year Own land (3 hectares on the average) High rice production Can sell produce from other farmer With rice mill, husk machine, pump machine Have motorbike & bicycle 70% houses are made from tiles and metal	House with tile roof Have motorcycle Have appliances in the house Livestock - 4-8 heads 3 hectares land own Work as helper Work in garment factory Income from livestock, rice and trading
VI	With rice mill, husk machine Average land own: 4 - 5 hectares Rent land to other farmers Enough livestock being use in farming Have generator Have motorbikes & bicycles House made fro wood and tiles roofing Have appliances like TV & radio	House with tile roof Own rice mill Have generator Livestock from 3 - 7 heads 6 - 7 hectares of land own Get income from rice milling

Activity Profile of the Village

Although considered as agricultural village, the residents perform different activities that are important to them and to their livelihoods. However, the most important activity for them is still rice production, as ranked by all groups in the village. There was no significant difference in the number and/or type of activities between economic and gender groups. However the importance of each activity differ with each group and also with each individual. Some of the reasons given during the discussion in terms of the importance of certain activities are that they can get more income, it's the only resource they have, and that is the only thing they know.

It is quite evident in **Table 4** that the people considered of great importance all activities that would give them income or those that would earn them money. For all groups rice production and raising livestock are considered their most important activities. These two activities seem to provide them the most income than the rest. However none of the groups mentioned household activities as important, like taking care of children and doing household chores.

There is not much difference between the socio-economic groups in terms of the list of important activities. As mentioned earlier, both groups have rice production and raising livestock as their most important activities, being assigned the higher number of beans during the PRA exercise, compared to other activities. In the poor group, the difference between rice production and other activities is bigger compared to that of the rich group. In the PA exercise, the group of poor women indicated the big importance of rice production to them by assigning 87 beans to it.

Although it was not ranked as high as the other activities, aquaculture and/or fishing were also mentioned as an important activity. Only the group of rich men mentioned aquaculture. The rich women did not mention fishing in the list, which could mean that aquatic resources for rich women only come from the culture system. However they still benefit from wild varieties by receiving them as gift from other people or by buying them when they need it. Only the rich women ranked fish culture as important but not very high though. Poor men gave fishing a bit higher ranking (4th). Fishermen particularly the poor benefit from it especially during the rainy season and even during the dry period as long as there are still some places in and outside the village with water.

Table 4 Summary of Important Activities in the Village by Gender and Socio-Eco Group

Socio-econ group	Gender	
	Men	Women
Rich	Rice production (63)	Rice production (64)
	Livestock (47)	Livestock (44)
	Cropping (41)	Making mats (24)
	Dig pond (wage labor) (35)	Cropping (19)
	Making basket & mats (29)	Selling (shop at home) (15)
	Fishing (18)	Tailor (11)
	Wage labor (14)	Raising fish (12)
	Selling (9)	Making wine (7)
Poor	Rice production (56)	Rice production (87)
	Livestock (41)	Selling/trading (36)
	Cropping (25)	Livestock (30)
	Fishing (13)	Wage labor (29)
	Wage labor (7)	Fishing (22)
	Handicrafts (7)	Cropping (20)
	Selling (7)	Making mats (11)
	Collect wood (4)	Collect wood (2)

Seasonality

The seasonality calendars were done by four groups and illustrated the condition of the village for the whole year. Different groups mentioned different activities in the year. There are differences in perception of the villagers in terms of climate, festivals, migration and health. However the calendars started at the same month - April - which is normally the start of rice cultivation. It is also the start of the year in the *lunar* calendar (refer to samples of seasonal calendars in annexes).

Weather. In general the village has three seasons namely: dry/hot season, rainy season and cold season. The start of the dry or hot season is different for each group. For the poor women, theirs start the earliest, which is during early December and ends in June. The rich

women only experience hot weather between March and April. One explanation to this is that normally it is the poor women who work in the field to collect wood, plant crops and collect aquatic animals while rich women usually stay in the house and do other business that will not require them to be under the sun thus they do not experience too much heat.

The rainy season is the most awaited season in the village since farming activities usually start when the water supply comes. Fishing and agricultural activities are the main activities depending on the rain. All the groups except for the poor women think that the rain starts as early as June. For the poor women, the rain only starts during the month of September, which is the peak period of rain for all three groups. The poor women have the shortest period of rain (2 months), while the rest of the groups experience at most eight months of rain. However the rain is not continuous during these eight months.

In one village, not all the groups experience the cold season. The poor men did not mention cold climate in their calendar. The start of the cold season for poor women and rich men are the same. They start experiencing cold weather in November and ends in January.

Tradition. Generally the village celebrates all festivals in the country. However there are some differences in terms of what festivals are celebrated or observed by the different groups. Most of the activities and festivals are related to their religious beliefs. There are some festivals also that are related to agriculture.

Between socio-economic groups, the number of months with festivals varies. Based on the calendar that the villagers produced, it is the poor men who celebrate most of the festivals. In every month, the poor men celebrate at least one festival and at times two at most. Poor women observe the fewest festivals and have more months wherein they do not observe any festival at all. For the rich group, both men and women celebrate the same activities and festivals.

Economic activities. As earlier discussed in the portion about important activities, most of the activities that the villagers do are income generating or would result to monetary benefits. Some of these activities are done regularly, some once a year, depending sometimes on the resources and farmers' time. The seasonal calendars of economic activities helped determine which are the economic activities that give continuous/regular benefits to them. The seasonal diagram also described what activities are common in a particular time of the year.

Table 5. Summary of Common Economic Activities in the Village by Gender and Socio-Economic Groups

Socio-econ group	Gender	
	Men	Women
Rich	Rice production Livestock Fishing Dig ponds Make fishing gear Making plough	Rice production Cropping Livestock Fishing Making mats Making wine

	Making basket Collect woods Construction Selling	Collect wood
Poor	Rice production Cropping Livestock Digging ponds Fishing Making fishing gear Collect woods Trading Carpentry	Rice production Cropping Livestock Fishing Making mats Making wine Collect wood Trading

The seasonality of economic activities in this village has some differences among the different groups. The diversity of economic activities of men was not totally different from that of the group of women. Done almost the whole year are rice production, raising livestock and fishing. Rice production is considered the most important, with both rich and poor men having activities related to rice production from April to January. For livestock raising, the poor men only do activities related to this during their free time from the field. However, the rich men have activities related to livestock raising for almost 11 months in a year. But there is not much activity for livestock during the months of September and November.

For fishing activities, collection is done almost the whole year by the rich men group. It is only in September that they do not have much fishing-related activity since it is also the month when they are busy in the rice field for transplanting and harvesting. For the poor and rich women group, they have almost the same activities in the year regarding AA collection. Both groups do not have activities in June. However, only the poor women collect AA in the village during the months of September and January (see annex).

The seasonality of economic activities of women is almost the same among the rich and poor groups. Still, the main economic activities being done almost the whole year are rice cultivation and fishing. However there are still other economic activities being performed by the women. They usually do these during their free time from the field.

For the men, the economic activities that are performed for almost the whole year are livestock raising and rice cultivation. Fishing can also be considered under this activity group since rich men do this for ten months in a year. There are also seasonal activities that both the rich and poor men get involved in. Carpentry is an example of an activity being done only by the poor men. However, most of the economic activities such as working in construction, making basket, and working as paid labor are done by the rich men. These are being done only during the season when rice farming is not happening.

Migration. Moving from one place to another is the result of insufficient livelihoods for the villagers. Social relations could also be another reason for farmers' migration. In this

village, the migration is more due to economic or monetary reasons. Also, the movement is not permanent but merely seasonal. Migration seems to be common in every group in the village. Most of them move to other provinces but usually to the capital of the country or the more progressive provinces to work as helpers. The women mostly work in garment factories while men tend to work in construction sites. Some earn from driving a motor-taxi. These villagers go back to their own villages during the planting season and harvesting. Some villagers who work full time in the capital just send remittances to their family. People also go back to the village during festivals particularly during the new year.

Health. The health condition in the village can be considered normal. Villagers do get sick at times with light illnesses just like other people in other places. The most common causes of sickness are the change of weather and extreme fatigue from doing agricultural work. There was no information given about the occurrence of malnutrition in the village. Colds and flu are the common sicknesses during the rainy season. Rich women did not give much information regarding health while the other groups provided more information about the health conditions in the village during the year. There was no major health problem mentioned.

Role of Aquatic Animals

The role of different aquatic animals in the livelihood of the villagers can be determined based on the different criteria used by villagers in ranking the importance of aquatic animals. In general, aquatic animals provide income to the farmers while at the same time contribute to food security in the village. The importance of aquatic animals differs among the various economic groups and also in terms of gender groupings.

For the rich group, the taste, availability and high value were the criteria that ranked high. For the rich women, availability was assigned a larger number of beans compared to other criteria. High value did not get a high rank in the poor unlike in the rich group. The most important criteria for the poor group are the following: the AA is easy to catch, can be eaten by the family, and the taste.

Another criterion used particularly by the poor group is the easiness for collecting AA. Unlike the poor group, the rich group has good fishing equipment that enables them to catch a lot of species. The poor group on the other hand does not have enough money to get modern fishing gears. And because of the lack of good fishing gears, the poor group would usually collect only those species that do not require special gears.

Food Security. The most important role of aquatic animals that was identified by the villagers during the PRA workshop is concerning food. From the number of criteria listed in Table 6, majority refers to the preference of villagers in terms of consumption of the species. However different groups have different ranking of the criteria.

The criteria used by rich group that relates to food consumption are: taste (which ranked the highest for the men and second for the women group), and good processing. For the poor group, taste also ranked high for the women group. Some criteria used by the poor groups

relate to food consumption like: can be processed, not very bony, the family can eat it, and its availability.

Sources of Income. One of the most apparent reasons why farmers in the village collect aquatic animals is that they need additional income. In Table 6 below, the rich group used and ranked 'high value' as an important criterion. This means that the rich group sells AA. They also consider the selling price of the AA when they collect them. However, for the poor group, factors such as "high value of AA" and "easy to sell" did not rank as the most important. This can be attributed to the reason that the poor group collects AA mainly for them to have available food. For them, income is only a secondary motivation.

Table 6. Summary of Criteria Used in Ranking the Importance of Aquatic Animals in the Village by Gender and Socio-Economic Groups.

Socio-econ group	Gender	
	Men	Women
Rich	Taste (39)	Availability (64)
	High value (36)	Taste (41)
	Availability (35)	High value (36)
	Spawn on wet season (35)	Easy to catch (34)
	Easy to catch (34)	Good processing (24)
	Good processing (21)	
Poor	Easy to catch (49)	Taste (42)
	Family consumption (28)	Availability (36)
	Availability (25)	Easy to catch (35)
	Easy to sell (25)	High value (26)
	High value (23)	Good processing (22)
	Tasty (20)	Family consumption (21)
	Processing (16)	<i>Deficit (4)</i>
	Drying (14)	<i>Bony (12)</i>

Important Aquatic Animals

During the identification of aquatic animals present in the village, all four groups were able to identify several aquatic animals. Each of the group presented a long list of aquatic animals that they collect, eat, sell or even give to their relatives and neighbors. The criteria that they use in ranking aquatic animals helped them identify the most important aquatic animals to the villagers. There are some similarities of important aquatic animals among the groups but there some differences were also noted.

The most common aquatic animals identified as important are big wild fishes like the snakehead (*Chana*), and Catfish (*Clarias*). There are also small fishes identified as important

like rasbora, climbing perch (*Anabas*), spiny eel, and featherbacks. Aside from fishes, there are also none-fish varieties that were identified as important AAs like frogs and small shrimp.

The important AAs of social groups differ. The rich group has a different set of important aquatic animals compared to that of the poor group as presented in Table 7. However the most important AA - considered as the snakehead - is the same with the two groups. The rich group has spiny eel, catfish, small prawn and frogs, bronze feather back, as some of the most important AAs to them. Among the identified important AAs, white sheathfish got the lowest number of beans from the rich group. The composition of important aquatic animals for the poor group is different from the rich except the top most item in the list, which is the snakehead. Bronze featherback ranked second (higher rank than in the list of the rich group), followed by climbing perch and yellow catfish. Spiny eel got the lowest number of beans among the important aquatic animals identified by the poor group.

Table 7 Summary of Important Aquatic Animals in the Village by Gender and Socio-Economic Groups.

Socio-econ group	Gender	
	Men	Women
Rich	Snakehead (22)	Snakehead (25)
	Catfish (20)	Frog (23)
	Spiny eel (16)	Spiny eel (20)
	Climbing perch (15)	Eel (18)
	Rasbora (13)	Catfish (15)
	Yellow mystus (13)	Small shrimp (11)
	Bronze featherback (12)	Whisker sheatfish (10)
	Small prawn (12)	Bronze feather back (10)
Poor	Eel (16)	Snakehead (17)
	Snakehead (15)	Climbing perch (17)
	Yellow Catfish (11)	Bronze featherback (17)
	Spiny eel (10)	Catfish (15)
	Bronze feather back (10)	Whisker sheatfish (15)
	Great white sheatfish (10)	Eye spot barb (15)
	Climbing perch (9)	Small shrimp (13)
		Rasbora (13)

In terms of gender, and regardless of socio-economic groups, the list of important aquatic animals also differs. For the women group, the snakehead (*Chana*) again topped the list and followed by catfish (*Clarias*). Bronze feather back and sheatfish follow and also the small shrimp. These three species had little difference in terms of the number of beans assigned to them. The last important specie for the women is rasbora that got the same number of beans from the men. The men group also put the snakehead at the top of their list, receiving the most number of beans than the other species. Spiny eel came next to the snakehead, with little difference from the third specie, which is the climbing perch. The great white sheatfish got the lowest number of beans amongst the list of aquatic animals of the men group. One of the

main differences between the men and women group is that the women included non-fish varieties like small shrimp in upper part of their list that was not the case with the men group. However, the men also identified shrimp as important. On the other hand, both rich and poor women groups considered the shrimp as very important to them, while only the rich men mentioned the small prawn as an important AA.

Sources of Aquatic Animals

Sources of aquatic animals in the village were identified and reflected in the village map and also in the seasonality calendar of aquatic animals. During the identification of AAs in the village, the sources of these aquatic animals were also discussed. One of the main sources of AA in the village is the lake. Farmers from the village and even from other villages collect AAs from this aquatic system. The rice fields also become a major source of AAs in the village during the rainy season. Most of the small AA species like shrimps, crabs and frogs are collected from the rice fields. The ditches, household ponds and canals in the village also serve as sources of aquatic animals. Farmers benefit from these water bodies only during the rainy season. During dry season most of these water bodies dries up.

Gear Used

The different types of gear used did not change much with the season. The gear used normally changes based on the specie the farmers intend to catch or collect. In general, villagers only use their local gears. Only a number of fishermen in the village can have improved fishing gear. The use of cast net (*sam nagn*), gill net (*morng*) and the like are most common. Usually, the men use these gears. On the other hand, children and women use the handled scooping basket (*chheang day*), handled pick out (*ang rut*), bamboo traps, and small handled drag net (*angn chourng*). Sometimes, the villagers also use spears and their bare hands.

Seasonality of Aquatic Animals

One of the criteria used in ranking the importance of aquatic animals is the availability of the species (see Table 6). Not all species are available the whole year and not all of them can be found in the same place throughout this period. Some species are abundant during summer and some during the cold season. However, most of the species are abundant during the rainy season (see "Seasonality of Aquatic Animals" in annexes).

According to the poor men group, only the climbing perch and eel are abundant in the area during summer since these two species thrive in shallow waters. Farmers can catch these species in ditches, ponds and trap ponds. Snakehead, catfish, spiny eel, and feather back are limited in number during this period. These species are collected from trap ponds, ponds and lake. However, during the summer period, their population is very small. The quantity of eel remains the same only until June and become limited from July to October, which is the peak of the rainy season. The climbing perch seems to be unaffected by the climate, as its population remains the same the whole year. However, the size of the specie changes. The snakehead and feather back become abundant during the month of July while catfish remain limited up to the

month of October. The spiny eel is abundant during the peak of the rainy season, which is from June to October. All the species mentioned by the poor men (eel, snakehead, catfish, spiny eel, and bronze feather back) start to decline in population again from January to March. Only the climbing perch does not change in quantity (please see seasonality of aquatic animals in annexes).

The perception of poor women regarding supply of AA is different from that of the poor men. Poor women believe that most of the aquatic animals decline in number during summer or April in particular. They also think that the only aquatic animals that are abundant are the snakehead and bronze feather back, which are both scarce according to the poor men's point of view. The climbing perch seems to have different seasonality for the poor men, while the poor women view the climbing perch as deficit in supply from April to July. Species that are most of the time abundant are small shrimp, snakehead, whisker sheatfish, catfish, and bronze featherback. For all the species, poor women use different gears for different places. The most common places mentioned in the seasonality exercise are ditches, ponds, lake and small streams. Jump trap, hard traps, hook and line are some of the gears used by the poor women.

The rich men, like the poor men, think that most of the aquatic animals are limited during the dry or summer season. Most of the species can only be caught in the lake using traps and gill net. During the month of May, some species cannot be collected like rasbora. Rasbora cannot be seen and/or collected from May to September. All the species start to increase in population, if not abundant, from October to December. In December some species already start to decline again like the spiny eel. During this month also, farmers collect aquatic animals only from ponds, ditches and trap ponds. In the rice fields, farmers collect aquatic animals during the rainy season or during the period of June to September.

According to the rich women's point of view, most of the aquatic animals are limited and some do not even exist during summer. Most of the aquatic animals that are important to them can be collected from the lake during summer. However the eel cannot be collected during this period until July. Snakehead and frogs increase in population starting in the month of June. During this time rain is experienced in the area and fields get water. For the whole year only frogs and snakehead are abundant in most of the months based on the perception of rich women. The rest of the aquatic animals that are important to them are always deficit or small in quantity. Whisker sheath fish for example is only available from March to April.

Trends of Aquatic animals

The villagers discussed the trends of aquatic animals during the PRA workshop. The purpose of this activity was to understand the reason behind and the status of the decline (if declining) of aquatic animals in the area. The different groups showed different perceptions about the status of the different aquatic animals. However they agreed to some of the reasons for the increase and decrease of the population of some aquatic animals. This activity only covered the status of important aquatic animals since 1960 to the present period.

In 1960 most of the aquatic animals identified by all groups were abundant in the village. Aquatic animals can be collected in great quantity from lakes, and rice fields using simple gear.

The situation of aquatic animals remained the same until 1980. The status of aquatic animals started to change after 1980 when modern fishing gears were introduced in the village. The increase in the population in the village also affected the population of the aquatic animals since the demand for aquatic animals as food increased. Aside from these factors, changes in the environment during the mid-1980s due to agriculture technologies also caused the drastic decline in AA population. At present all groups believe that all aquatic animals are deficit in supply due to the different factors that were discussed (see trends of aquatic animals in annexes).

Farmers' Meeting

After all the outlined activities for the workshop were accomplished, the team made a brief summary of the information. The outputs from each exercise were presented again to the big group for clarification and to get any additional information. The villagers verified the information presented. After the presentation the villagers expressed their thanks to the team and vice versa. It was a great learning experience for both groups who did the PRA. The village headman expressed his plan of using all the information gathered in planning for the development of his village.

Annexe

Seasonal Calendar

Weather

Poor men

April Hot, windy	May Cloudy, little rain	June Hot, rainy	July Rainy and sunny	August Rainy, cloudy	Sept Rainy and cloudy	Oct Hot, rainy	Nov Rainy and hot	Dec hot	Jan hot	Feb Hot	Mar Hot
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Poor women

Sunny and rainy	Sunny and rainy	Sunny and rainy	Rainy	Rainy	Rainy	Rainy	Rainy	Sunny	Sunny	Sunny	Sunny
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Rich men

Sunny	Sunny and rainy	rainy	rainy	rainy	rainy	Little rain	Hot, a little windy	Cold am, pm, hot during day	Cloudy and sunny	sunny	Sunny
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Rich women

Sunny	Sunny and windy and storm	sunny	rainy	rainy	rainy	Rainy and windy	Sunny and windy	cold	sunny	Sunny and cloudy	Sunny and cloudy
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Social events

Poor men

April Khmer New Year	May Blessing of Buddhism statue	June Celebratio n to generate funds for constructio n of Buddhism related activities	July Planting School break	August	Sept Pchumban ceremony	Oct	Nov Full moon ceremony	Dec	Jan	Feb	Mar
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Poor women

Khmer New Year	Blessing of Buddhism statue		School break		Beginning of school, and P'chumban Ceremony	Celebration to generate funds for construction of Buddhism related activities	Water festival		Start of planting season (Meak Bochea)		
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Rich men

Khmer New Year	Plowing ceremony Blessing ceremony	International children day Blessing ceremony	Planting ceremony, start of rainy season		End of rainy season	Celebration to generate funds for construction of Buddhism related activities (Kathantiane)	Water festival Full moon ceremony King birthday, independence day	Blessing ceremony for dead people,	Monks Blessing ceremony of budhist images	As December	As December
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Rich women

New year Wedding ceremony	Buddhism moon International labor day Royal Plowing ceremony Wedding	International childrens day, queen's bday Ceremony for start of rainy season Monk stay in pagoda	Ceremony for start of rainy season	Month of transplanting	Pchumban ceremony	End of rainy season ceremony Kathannati ane ceremony King's bday	Water festival, full moon	Harvesting ceremony	Seven January ceremony	Pachayboun ceremony Wedding ceremony	International womens day
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Economic Activity

Poor men

April First rice production, rice field maintenance	May Transp prep, transp, RF maintenance, collect wood,	June Transplanting , fishing of fish and frogs	July Transplanting , fishing, livestock, collect thatch, RF maintain	August Transplanting , RF maintain, livestock, collect wood	Sept Fishing, livestock, collect wood for selling	Oct First harvesting Collect wood, processing	Nov Last harvesting, processing, Collect wood, house construction, carpentry	Dec Livestock Worker for construction	Jan Collect wood, fishing	Feb Crop production	Mar Crop production
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Poor women

Collect wood Rice field maintenance, Fishing using small seine net (Chup)	Rice field maintenance, RF prep for sowing Collect wood Fishing using chup	Sowing rice, Collect wood Rice milling (processing) Fishing using chup	RF maintenance, Crop production Fishing using chup and draining	Transplanting , RF maintenance Fishing	As August	Collect grass for livestock feed, Fishing	First harvesting Processing, Fishing	Third harvesting, Rice processing, storing of rice Fishing using chup	Weaving thatch, making mat, livestock, fishing, house/farm maintenance (eg. building fence)	Collect wood Fishing using chup	Collect wood for cooking Weaving thatch (- Fixing roof)
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Rich men

Sugar palm processing, collect wood, livestock, crop production, moto taxi, trader, fishing, selling livestock,	RF prep, sowing, crop production, collect wood, selling livestock, fishing, sugar palm processing	RF preparation, RF maintenance, sowing rice, transplanting, thatching, selling livestock, fishing, making mats, collect wood	RF prep. Transplanting , crop production, RF maintenance, sowing second rice, selling livestock, fishing,	Harvesting first rice, transplanting, wet season rice, livestock, worker, collect wood for selling, corop production, fishing	Transplanting , wet season rice, fishing, livestock, selling livestock, worker	Collect feed for livestock, RF maintenance, livestock, collect leaves for mat, collect wood (all sorts), fishing,	Harvesting first rice, (of wet rice), crop production, collect wood, collect leaves for matting, make mats	Harvesting the rice Processing rice, storing rice, trader, livestock,	Storing rice, sugar palm processing, collect wood, crop production	Collecting palm juice livestock Collect and selling wood Crop production	Livestock Collecting palm juice Collecting the wood Crop production
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Rich women

Rice field preparation, crop production, collect wood, making mats, livestock	RF preparation, collect wood, trader, house worker,	RF maintenance, housework, fishing, taking care of kids, livestock, husking rice, milling rice (processing)	RF preparation, RF maintenance, fishing, crop production, trader, livestock	RF maintenance, livestock,	RF maintenance, crop production, collect wood,	Housework, make fan, make rice storage, make mat, fishing, child care	Harvesting, rice processing, storing rice, collect wood for selling	Storing rice hay for livestock, clean house, go to PP to make fermented fish, (buy, process and take home), worker, trader, (exchange f-fish for rice)	Make f-fish (prahak) worker	Selling (cakes and other homemade produce), mainly at home, housework, take kids to school.	Housework, seller (as before, cakes and other things for cooking), livestock
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Health

Poor men

April Happy	May Normal	June Happy	July Normal	August Normal	Sept Happy	Oct Cholera Flu, typhoid, unhappy	Nov Happy	Dec Cholera Malaria Dysentery	Jan Normal	Feb Unhappy	Mar Normal
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Poor women

Fever, stomach problem, unhappy	Normal	Normal	Normal	Flu	Flu	Flu	Difficulty in breathing, cracked lips	happy	happy	Happy	Happy
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Rich men

Happy	Malaria Flu	Normal	Normal	Normal	Normal	Normal	Flu	Happy	Happy	Happy	Happy
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Rich women

Malaria Flu, dengue fever,	Stomach problem, dengue fever, high fever	Malaria Dengue, flu, High blood pressure	Flu, fever	Good health	Good health	Fever, Malaria	Dengue fever, malaria, flu	Dengue, high temperatur e, cold	Cold, high fever	High temperatur e Malaria	Malaria dengue Headache
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Migration

Poor men

April	May	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb	Mar Go to earn money in Battambong province
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Poor women

										Move to Kompot province to sell dried fish, and exchange fermented fish for rice	Move to Kompot province to sell dried fish, and exchange fermented fish for rice	Go to Kompong Speu province, to trade MSG for rice
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Rich men

Most of men go out the village to work	Equal number of men and women working outside the village	Most of men go out the village to work	Most of men go out the village to work	Equal number of men and women working outside the village	Equal number of men and women working outside the village	Only men work outside the village	Equal number of men and women working outside the village	Equal number of men and women working outside the village	Most of men go out the village to work	Only men work outside the village	Only men work outside the village
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Rich women

Most of the women go to other village to work	Most of the women go to other village to work	Most of the women go to other village to work	Few men and women go outside village to work	Few men and women go outside village to work	Few men and women go outside village to work	Few women go outside the village for work	Most of the women go to other village to work	Few men and women go outside village to work	Most of the women go to other village to work	Few women go outside the village for work	Few women go outside the village for work
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Activity Scoring

Rich men group

V1rm	Chuoun Kop	Miak Sien	Dou Chhout	Soaor Ra	Um Ngeoun	You Chhoy	Choun Chhal	Kun Sien	Svay Taa	Phum Ront
Ricefield	10	12	8	6	10	9	9	12	11	13
livestock	4	8	6	6	4	7	7	8	6	7
Planting crop	0		3	4	3	2	0	0	3	
Process pjuice	2		1	4	0	0	0	0		
Collect wood	2		1	0	2	2	1	0		
Worker	0		0	0	0	0	0	0		
Fishing	0		1	0	0	0	1	0		
Seller/trader	2			0	1	0	2	0		

Rich women

V1rw	Phon Haim	Haim Moa	Touch Soar	Do Bean	Soth Thir
Raising Livestock	0	5	5	3	3
Ricefield	6	5	6	4	3
Planting crop	3	2	3	3	3
Household activity	3	2	2	3	3
Go to Pagoda	6	1	1	2	4
Taking care of children	2	2	2	2	2
Selling at home	0	1	1	2	2
Fishing in ricefields	0	2	0	1	0

Poor men

V1pm	Mias Hait	Phum Kea	Thien Sarreoun	Mian Thou
Rice Production	5	6	5	6
Constructing house in the village	3	5	4	0
Plowing for planting crop	4	3	0	3
Collect the wood from forest	0	0	5	4
Fishing	1	0	0	2
Taking care of cow (livestock)	4	2	3	4
Planting crop (corn, cassava, sugarcane)	3	4	3	1

Poor women

V1pw	Sdang Moa	Van Reoun	Van Ouk	Op Paal	Jeea Kaam	Nyap Ty	Lao Meang	Meak Pring	Cheao Hoy
Collect wood	1	0	0	0	0	0	0	4	5
Rice field	9	6	8	10	0	10	6	3	4
Fishing	0	0	0	0	0	0	2	2	3
Weaving palm leaves, coconut leaves	1	3	0	0	0	0	3	2	0
Planting crop	1	7	0	2	0	2	3	2	3
Making mat	1	0	0	0	0	0	2	3	2
livestock	9	4	11	8	0	8	4	4	3

Aquatic Animal Identification and Scoring

Poor men

Species	Characteristics							
	Family consumption	Easy to sell	Tasty	Processing	Drying	Easy to catch	Availability	Prefer to eat
V1pm								
Rasbora	3	0	0	1	0	1	2	1
Small shrimp	3	0	0	1	0	2	1	2
Snakehead	1	4	3	0	3	0	0	2
Climbing perch	2	1	1	3	0	2	1	2
Catfish	3	2	2	1	2	1	1	2
Mystus	2	0	1	0	0	1	1	2
Spiny eel	2	3	1	2	1	0	2	1
Pygmy gourami	1	0	0	1	0	1	1	1
Three-spot gourami	0	0	0	2	0	1	0	1
Whisker Sheatfish	2	1	0	0	0	0	0	1
Yellow mystus	1	2	1	2	1	1	0	2
Frog	1	1	1	0	0	0	0	1
Ricefield Frog	1	0	0	0	0	0	0	1
Freshwater Eel	1	1	0	0	0	0	0	0
Snake	0	1	0	0	0	0	0	0
Freshwater turtle	0	1	0	0	0	0	0	0
Crab/shell/snail?	1	0	0	0	0	1	0	1
Monitor lizard/mouse	0	1	0	0	0	0	0	0

Poor women

V1pw	Family consumption	Easy to sell	Tasty	Good processing	Drying	Easy to catch	Availability
Small shrimp	4			4		3	3
Rasbora	3					3	2
Climbing perch	4	2	4	2		3	3
Pygmy gourami	3					3	2
Catfish	3	4	3	4	4		
Snakehead	4	2	3	2			1
Mystus	2					2	2
Three-spot gourami	1						
Spiny eel	3		4			4	3
Frog	1					2	
Crab						1	
Toad						1	2
Eel	1						
(Big) Snail	1						
Pond/river snail	1						

Rich men

V1rm	Tasty	Availability	Easy to catch	High value	Processing	Family consumption
Catfish	3	3	1	3	1	2
Snakehead	3	3	2	3	1	2
Mystus	1	2			1	1
Yellow mystus	1	1				
Climbing perch	3	3	2		1	2
Whisker Sheatfish	3		2	2		2
Small prawn		3			1	2
Blackline rasbora	3				1	
Roughskin frog		3				
River snail,		3				1
Snail		3				1
Rasbora		3				2
Bivalve		1				1
Crab		3	2			2
Water insect 2 (like big cockroach)		3				
Spiny eel		3				2
Frog		3	2		2	2
Ricefield frog	3		2	1		1
Freshwater goby						
Eel	3	3		2	2	2

Rich women

V1rw	Deficit	Processing	Bony	Cheap	Less tasty	Tasty	Availability	Easy to catch	High value
Climbing perch	0	3	3	0	0	2	2	2	2
Snakehead	0	3	1			3	3	3	3
Catfish	0	2	1	0	0	3	3	4	4
Yellow mystus	1	1	1	0	1	1	1	1	
Spiny eel	0	1	1						
Small prawn	0	1		1			4	3	
Rasbora	0	1		1	1		2	2	
Mystus	1	1	1	1	1				
Freshwater goby	1			1		2	3	1	2
Snail	0				1		1	1	
River snail	0			1	1		1	1	
Eel	0	1	1			2			3
Frog	0					3	2	1	3
Crab	0	1		1	1		1	1	
Ricefield frog	2			2	1	1			
Silver Rasbora	0	2			1		2	1	

Seasonality of Aquatic Animals

Poor men

	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Catfish	Using torch in collecting at night and during the rain, line, gill net, cast net, collect more in the rice field	Abundant torch, line, gill net, cast net, in rice fields	Cast net, oblong trap, line	Cast net, oblong trap, line	Line, oblong trap	Line, oblong trap	Line, oblong trap	Abundant, jump trap, lighting	Cast net, line, fishing in the community pond	Cast net, line, fishing in the community pond	Cast net, line, fishing in the community pond	Cast net, draining ponds and ditch
Snakehead	Abundant in rice field, torch, line, cast net	Abundant, torch, line, oblong trap	Catch small amount, hook long line	As June	As June	As June	As September, but abundant	Abundant, jump trap, lighting	Hook long line, hook line, line, draining	As December	As December	Hook long line in ditch
Spiny eel	Oblong trap Hook	Hook	Hook	Oblong trap, hook	Oblong trap, hook	Oblong trap, hook	Oblong trap, hook	Oblong trap, hook	Oblong trap, hook	Hook Catch in the ditch	As January	As January
Climbing perch	Oblong trap, torch, gill net	Torch, gill net	Gill net, line, oblong trap (Lop)	As June	As June	As June	As June	As June	As June	As June	As June	As June
Yellow mystus	Catch small amount, cast net	Scarce, cast net,	As May	As May	As May	As May	As May	As May	As May	Cast net	Cast net	Cast net
Small shrimp	Scoop net, (collect 2 cages in 3-4 days= abundant?))	As April	As April	As April	As April	As April	As April	As April	As April	As April	As April	As April

Participatory Rural appraisal in Prey Tadoc

Poor women (actually, V1 doesn't have a lake, it is a reservoir)

	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Abundant Draining, lake and channel	Abundant Gill net, cast net, line	Not so abundant, bamboo net, scoop net	Torch, line, hook long line Men go on fishing	Torch, line, hook long line Men go on fishing	As August, plus oblong trap	As September	Jump trap, trap fish during migration, cast net, line, men go fishing	As November, minus cast net	Lighting, jump trap, bamboo net, scoop net, men go fishing	Jump trap, fish during fish migration, bamboo net, scoop net, men go fishing	Draining, cast net, bamboo net, scoop net
Catfish	Abundant, lake and canal	Abundant, bamboo scoop net	Catch small sizes of catfish, bamboo net, scoop net	Men go fishing, as June	As July	As July	As July	Catch when water in the rice field subsides	Catch when water in the rice field subsides	Catch when water in the rice field subsides	Catch when water in the rice field subsides	Catch when water in the rice field subsides
Climbing perch	Abundant Catch by draining lake, small stream	Abundant, scoop net, bamboo net, only small fish	Moderate, bamboo net, scoop net, men go fishing	As June	As June	As June	As June	As June	As June	As June	As June	As June
Small prawn	Abundant Oblong trap, bamboo net, scoop net, draining	Abundant, bamboo net, scoop net, draining	As May, but moderate	Men go fishing, lighting, line, hook long line	As July	As July	As July	Abundant Catch in rice field when water evaporates	Moderate, scoop net, bamboo net, lake	As December	As December	As December
Rasbora	Abundant Scoop net, bamboo net, draining	Abundant Scoop net, bamboo net	Moderate, scoop net, bamboo net	As June	As June	As June	As June	Abundant Catch as water evaporates from rice field	As November	As November	As November	As November
Spiny eel	Abundant Draining, scoop net, bamboo net	Scarce, scoop net, bamboo net	As May	As May	As May	As May	As May	Abundant Catch when water evaporates from rice field, hook, ditch	As November	As November	As November	As November

Participatory Rural appraisal in Prey Tadoc

Rich men

	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Abundant Less water, more fishermen, not electro fishing	Moderate A little rain	As May	As May	Abundant, more water, more spawning place, in rice field, draining	Moderate Cast net in channel, enough rain	Abundant Scoop net	Abundant Jump trap, line, gill net, hook long line, rice field	Less abundant, little rain, little water rice field	Less abundant, not enough water	As January	As January
Catfish	Scarce, not enough water	Moderate, not enough water	As May, plus use hard trap and gill net	Moderate Little water, use more illegal gear	Abundant, enough water, fish can spawn	Abundant, more water, more fish	Abundant, heavy rain, more fish,	Abundant Rice field, more water	Moderate, less water, in rice field	Scarce, less water	Scarce, no water	Scarce, no water
Climbing perch	Scarce No water,	Moderate Less water	Abundant More water for fish spawning, gill net and scoop net	Moderate More water for fish spawning, draining trap pond	Abundant More water for fish spawning	Abundant More water	Moderate Catch a few fish	Abundant More water in trap pond	Abundant Fishing in trap ponds and channel	Less abundant Less water	As January	Scarce
Frogs	Scarce, no water	Moderate Dig	Moderate Line	Moderate	Abundant More water, can catch more fish	Abundant Lakes and Ditch	Abundant Trap ponds	Less abundant	Less abundant Less water	Less abundant Less water	Less abundant Less water, hook	Less abundant Lighting
Eel	Moderate Less water, more fishermen	Moderate Eel trap,	Moderate More fishermen	Moderate More fishermen, fewer eels	Abundant Not enough fishing gear to catch all the fish	Abundant Trap pond, ditch	Abundant Rice field	Abundant Lake, ditch, small stream	Abundant Ditch	Scarce Water evaporates	Scarce No place for fishing	Scarce No place for fishing
Whisker feather fish	Moderate Fishing in reservoir	Moderate Gill net	Moderate Few broodstock	Moderate More fishermen, fewer broodstock	Scarce Not enough broodstock	As August	As August	As August	As August	As August	As August	As August

Participatory Rural appraisal in Prey Tadoc

Rich women

	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Water is poor and fish is not abundant. Fishing at Dok Sap Fishing by hands	Not abundant, not much rainfall, by hand in village reservoir	Not abundant Less rainfall, net	Not abundant Pulling net Average catch of 0.5 kg per fishing in the village reservoir	Not rich Net Little time to fish due to transplanting	Medium Traps, Women can catch in rice fields Average catch 1-2 kg	Abundant Pulling net, in any flowing water in the village	Abundant Jump trap in the rice fields by women	Not abundant Draining rice fields manually to catch them	Scarce Net or bare hands by women	Scarce Net or bare hands by women	Scarce Pulling net or bare hands by women
Catfish (Clarias)	Scarce, Water level very low, catch by hand, can catch only 3 times a month	Scarce, poor rainfall, by hand in reservoir	Scarce, pulling net, village swamp	Scarce, pulling net, some catch lots, some don't catch much, have rain, Don't know how to throw net	Scarce, busy transplanting	Moderate, catch by trap in RF	Abundant, pulling net, collect small fish, in flowing water	Abundant, Jump trap	Scarce, drain field	Scarce, pulling net, by hand, drain water	Scarce, pulling net, by hands	Scarce, by hand and drain water
Climbing Perch	Water dried up Abundant Fish catch is much better than snakehead or catfish, draining, by hand	Scarce By hand in the village reservoir during draining	Scarce, 2-3 ?/time, village swampy area, some rainfall	Scarce, common gear used Don't know how to catch Fishing in village reservoir	Scarce No time to fish due to transplanting	Abundant Common gear, bamboo trap in rice fields Average catch per night 3 – 4 Kg	Abundant Pulling net and bamboo traps in flowing water, rice fields, channel, refuges	Abundant Jump trap, rice fields	Not abundant By draining refuge, hands (or by draining manually??)	Scarce Manual draining of refuge by women (or catch by hands ?)	As previous	Scarce Pulling net and pumping refuges (by hand??)
Rasbora	Not abundant, pulling net, 0.2kg/time, poor rainfall, village reservoir	Abundant Pulling net in village reservoir	Abundant Pulling net in village reservoir, Can catch 0.2 kg at a time	Abundant Pulling net in village reservoir, 0.3 kg/time	Abundant Very few go on fishing due to rice harvest	Abundant Women, bamboo traps in rice fields	Abundant Women, bamboo traps in rice fields	Abundant Women use bamboo traps and pulling net in rice fields	Less abundant Women use pulling net in the rice fields	Moderate Women uses pulling net	Moderate Women uses pulling net	Moderate Women uses pulling net
Spiny eel	Not abundant Low catch Water is poor	Not abundant Pulling net, village reservoir, poor rainfall, never buy	Not abundant Poor catch Lack of water	Not abundant Pulling net, reservoir, sometimes catch nothing, other times 2-3 heads/time	Not abundant No time to fish due to rice cultivation	Not rich Rice fields, bamboo traps at channel in village and rice fields	Abundant, rice fields, channel using bamboo traps, pulling net	Abundant, bamboo traps, pulling net, rice field and channel, stream	Poor, pumping our the rice field water (women)	Poor, pulling net, rice field, reservoir (women)	Poor, pulling net, rice field and reservoir (women)	Poor, pulling net, catch by hand, (women)
Small shrimp	Little, pulling net, big pulling basket, village reservoir	Moderate, pulling net, village reservoir, never buy, woman goes fishing	Moderate, pulling net, big pulling basket, reservoir, never buy	Abundant Pulling net in village reservoir	Rich, less time to fish due to busy with rice cultivation	Abundant, bamboo trap, pulling net, rice field, channel (women)	Abundant Pulling net, bamboo trap, rice field and channel	Abundant Bamboo trap, pulling net, rice field, stream, reservoir (women)	Poor, pulling net, reservoir (women)	Moderate, pulling net, reservoir (women)	Moderate, pulling net, reservoir, (women)	Moderate, pulling net, reservoir, (women)

Trends of Aquatic Animals

Poor men

Species	1960	1970	1980	1990	2001
Catfish	Abundant Lines and hooks being used Migration to rice fields take place during rainy season	Abundant in fish and water resources like refuges, and swamps No electro fishing	Abundant Few go on fishing due to Pol pot regime	No change	Low catch but still enough for family consumption
Snakehead	Abundant in rice fields, swamps, and waterways	Abundant	Abundant Few go on fishing due to Pol pot regime	No change	Less abundant Population increased Electro fishing being practiced
Spiny eel	Moderate	Moderate	Moderate	Moderate	Less moderate
Climbing perch	Abundant Available in every water body	Abundant	Abundant	Abundant	Low catch Number of fishermen increased Different fishing techniques being practiced including electro fishing
Yellow Mystus	Less abundant Difficult to catch	Scarce	Scarce	Scarce	Scarce
Small shrimp	Abundant Can be collected in ditches	Abundant	Abundant	Abundant	Moderate

Poor women

Species	1960	1970	1980	1990	2001
Snakehead	Abundant due to no electro fishing, Fish migrate to the rice fields for spawning hard trap ,cast net, line fishing	As previous	Fish is still rich as in 1970	Fish catch is poorer than previous years During wet season fishermen can collect 10 kg per night Number of fishermen increased and modern techniques in fishing being practiced are reasons for declining catch	As 1990
Catfish	Abundant due to common gear use, Fish migrate to rice fields hard trap, cast net, hook long line	As abundant as snakehead Fishermen can catch a lot	As rich as 1970	As snakehead above, fish catch is also the same	Can catch as much as 1990
Climbing perch	Abundant Fish migrate to rice field ecosystem for feed and spawning	Abundant as snakehead Fish catch also as previous	As abundant as 1970	As rich as catfish Fishermen catch fish for family consumption	As 1990
Shrimps	Abundant Can be caught in rice fields and swamp during wet season	More abundant than snakehead and catfish	As 1970	More abundant than other, bigger species	As 1990
Rasbora	Abundant	Abundant Can be caught in both wet and dry season	As 1970	More abundant than other, bigger species	As 1990
Spiny eel	Not rich Poor catch	Abundant Less catch	Not abundant	Less abundant Poor catch	As 1990

Rich men

Species	1960	1970	1980	1990	2001
Snakehead	Abundant because of lots of water resources hard trap being used in catching Few go fishing	Abundant Household number in the village is very small due to war Few fishermen	Abundant Household number in the village increased A lot of fishing gear being used Catch decreased Disease outbreak	Less abundant Population increased A lot of fishing gear being used Catching of broodstock Outbreak of disease	Fish population is small Illegal fishing being practiced by farmers Disease outbreak during October and November
Catfish	Enough water Less fishing gear Few fishermen go fishing	Abundant Household number in the village is very small due to war Few fishermen Fish grow and spawn in trap ponds and swamps	Less abundant Population increased and fishermen also increased Disease outbreak Low catch	Moderate	Poor catch Limited spawning place Electro fishing mostly used by farmers
Climbing perch	Abundant Enough water, a lot of spawning places, fishermen cannot catch a lot due to great amounts of lotus	Not so experienced in catching	Moderate Lack of spawning places	Abundant due to rainfall Farmers catching fish for their own consumption	Fish are abundant in swamps, rice fields and trap ponds
Frogs	Abundant in rice fields and swamps, a few eat frogs	Abundant	Less abundant Number of fishermen increased, long line fishing	Less abundant Number of fishermen increased, long line fishing	Less abundant Number of fishermen increased, long line fishing
Eel	Abundant	Abundant	Abundant	Abundant	Abundant
Ompok	Abundant but lesser compared to above species	Moderate	Less abundant	Less abundant	Less abundant

Rich women

Species	1960	1970	1980	1990	2001
Snakehead	Not so many fisherman catching this species, ordinary fishing gear	Abundant and very few fishermen, ordinary fishing gear	Ordinary fishing gear	Low fish catch	Many fishermen use electro fishing
Catfish	Abundant	Abundant	Abundant Ordinary fishing gear	Electro fishing Fish migrate to other area Low catch	Electro fishing
Climbing perch	Abundant	Abundant	Abundant Ordinary fishing gear	Abundant in the forest	Abundant
Rasbora	Abundant	Abundant	Abundant Ordinary fishing gear	Very few catch it	Abundant
Spiny eel	Abundant	Abundant	Abundant Ordinary fishing gear	Electro fishing being used Species becoming rare	Lot of fishermen using electro fishing Low catch
Shrimp	Abundant	Abundant	Abundant Few fishermen, ordinary gear	Abundant	Abundant Difficult to catch

