

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



Participatory Rural Appraisal in Boeung Village Case Study 6 (PRA Report from 2001)

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July 2002

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Beoung 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 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 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 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 were 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 activity that was done in the village was the validation of the information and getting feedback from the villagers.

Table 1 Schedule of activities during the PRA exercises in Beoung village.

Dates	Activities
14 June 2001	Collection of secondary data
15 June 2001	Introduction with the village Village profiling
16 June 2001	PRA workshop Feed backing

Svay Rieng Province

Province description

Location. Svay Rieng is situated 124 km away from Phnom Penh on the southeast part of Cambodia. It covers a land area of 2970 km².

Boundaries:

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

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

Ramdoul District

District description

General description. Situated close to the center of the province on the eastern side. Classified also as the mid land part of the province. The district has a total land area of 28,990 hectares.

Land use. A large portion of the district is being used for agriculture particularly rice cultivation. An estimated area of 20,729 hectares of rice fields and the rest are for forest and water bodies.

Waterbodies. Some of the water bodies present in the district are small lake and trap ponds. There is one big river/stream (*prek*) running from the northern part of the district down to the southwest connecting to Svay Rieng district.

Source of income. Main source of income is rice production. Other sources of the farmers are sugarcane production and planting high value trees.

Fisheries. Out of the 10 communes in the district only 2 do aquaculture. Still majority of the communes depend on the collection from the wild. Trap ponds, rice fields and community ponds are the common sources of wild aquatic animals in the district. Most common wild species being caught in the area are snakehead, anabas and spiny eel. There are some farmers in the area also raised *Pangasius*.

Kompong Amphil.

Commune description

General description. The commune is situated on the northeast part of the province and sharing border with Romeasheak district. These two areas are sharing a *prek* or a river, which serves as their boundaries. The commune comprises of 7 villages (see the list below). One of the village (Beoung) is the biggest fishing ground during rainy season, although not the poorest village in the commune.

Kompong Ampil Commune comprised 7 villages as follows:

1. Beoung	65 families
2. Kompong Anpil	112 families
3. Ta Sot	61 families
4. Ta Te	68 families
5. Toul Chreas	64 families
6. Svay Rolom	73 families
7. Tropaing Domrey	221 families

Source of income. Rice cultivation is the main source of income as mention in the provincial description. Aside from rice residents also get income from selling their livestocks and planting sugarcane, which is the second most important agricultural product in the commune.

Fishing. One village can be a completely fishing ground during rainy season. In this village fishing also can be a good source of income. In general farmers are fishing in the lakes and rice fields during rainy season.

Selection Process for the village

The selection of the village was done by drawing a transect line for the whole province from the northwest down to the southeast. By doing this transect line the line is passing the three topography of the province; higher area in northwest; midland and lower area in the southeast. A district first was identified from each topography level. There were three district identified in this province namely; Chantrea, Kampong Ro and Ramdoul.

From the transect line names of the communes situated close to or along the transect line were then listed down in a piece of paper. The stop then randomly selected the possible commune for study by randomly picking a paper from the pot with all the names of the commune. Second and third commune were also picked for possible replacement if the first commune is not possible.

After the commune had already been identified, the team visited the commune and clarified and got more secondary data about the commune and the different villages in the commune. The village was then identified using the criteria of the aquatic resource in the area, economic level of the village and also the number of the villagers.

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 perceptions of the different groups regarding the status of aquatic animals were also discussed during this period.

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 and had a brief meeting with the villagers to 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

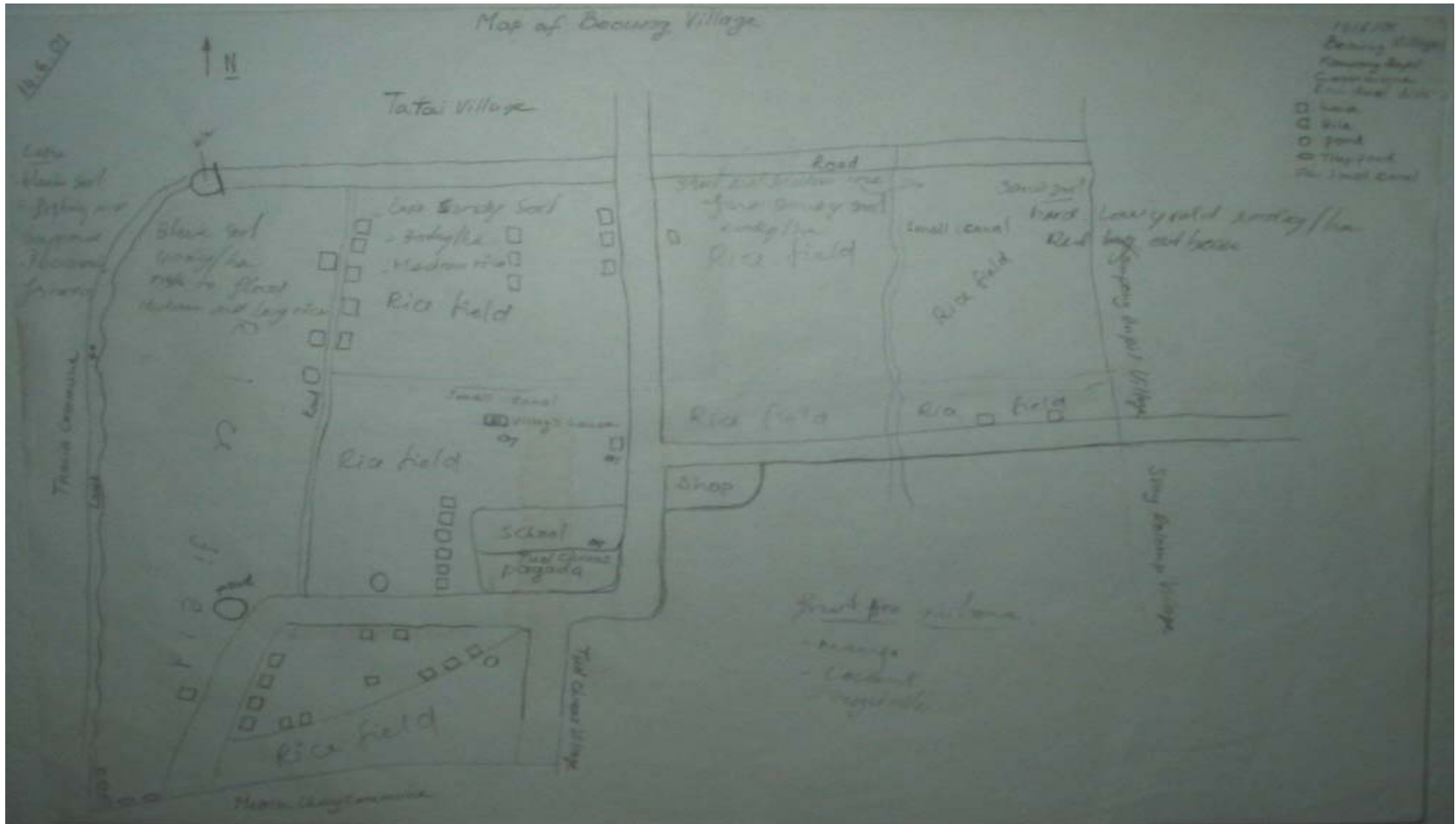
Generally the village "Boeung" is a representative of midland area. However the village was also selected from the commune, which represent the lowest and with aquatic resources available. As background although in the village map presented, there was no major bodies of water identified aside from the lake, the whole village becomes a big lake during rainy season. And so during the exercise on mapping and during the discussion, water bodies are very important resource in the village. Aside from the water body there are other resources that were identified.

Land resource. As the main economic activity in the village is rice production, large portion of the land in the village is being used as area for cultivating rice. Paddy fields are scattered in the whole village. Aside from rice, other crops also are being grown in the area.

Water resource. The major water body identified in the mapping was the lake, which is situated on the western side of the village. This lake serves as the main source of water for agricultural activities for the fields close to the lake. The lake also serves as one of the sources of aquatic animals for food and income. Aside from the lake, which is a common property, the village has several numbers of trap ponds, household ponds and ditches. A canal is also present in the village.

Physical resource. One of the major resources under this category is the road. It was drawn first in the map and while drawing farmers were discussing the important of this resource in the village and the villagers. Although the construction of the road was not included in the timeline (see Figure on Timeline of the village) it was mentioned several times during the discussion the impact of the road to them. There are also some shops in the village where farmers an get their basic needs for day to day.

Figure 1 Village Map of Beoung Village



Mapping the development in the village

The development of the village was discussed during the timeline exercise participated in by some old people in the village and also by young villagers. The village headman headed the group. The discussion was focused on the political situation of the village from the early years. The development history that was discussed in this exercise focused on three issues: political/economy, rice production, and fishing.

The history/timeline was started by the villagers from 1954, which was politically related. During this period informal groups were formed and revolted against the French. The polpot regime also during 1975 gave a very strong and damaging impact on them economically. Most of them lost their properties, livestock, legs, and the worst their family members. Year 1975-1979 was the worst regime to the villagers and because of that, a lot of people escape from the village and for those that were remained were forced to worked hard in the field. After the polpot regime, the villagers started coming back to the village and the status of living started to improved although they started from zero again. Other political events that is happening in the village is the election. It seems that it has an impact to them although in the activity they did not mentioned the impact but they did remember the years of the elections.

In terms of resources and agriculture, three stages of rice farming are very distinct in the village. The stages related also in the political stages. During the early years before the polpot regime, villagers are cultivating rice for their own consumption. From 1975 to 1979 farmers were cultivating rice as a community and the benefits do not go to them but to the Polpot. Then after the regime people started coming back to the village and started cultivating rice again and in 1986, the government provided the land to the farmers for them to manage their own land.

For aquatic resources, even before the polpot regime, the wild aquatic animals were abundant in the area for two reasons; first is few people living in the village and the second, people are afraid to go out and need to work for the polpot. One major event that had happened concerning aquatic animals was when the disease outbreak in 1986. Since then the abundance of the aquatic animals started to decrease. However the cause of the decrease was not only caused by the disease outbreak but also due to the increase in the farmers collecting aquatic animals. In year 2001, farmers believe that one of the reason that caused the decrease of aquatic animals was because of the introduction of chemical fertilizer and pesticide. Among the species that were affected by the disease were snakehead, catfish, three spot gourami and eel.

Table 2 Historical Development in Beoung Village

Year	Events
1954	Established informal youth group and educated them to defense the village by used weapons wood.
1972	American had drop bombs into the village and kills one buffalo; People feared and lived in underground. Rice farming has done for irregular time because of bombs.
1975	Pol Pot regime, People eat and worked in the community
1977	Leaved People from village to Romeas Hek district until 1978 leaved people to Prey Veng and Pursat provinces. People can't live in the village.
1979	The survivals People came back to their homeland. They do the rice farming in community from 10 to 15 households and have limited livestock (2-3 pairs). Red cross distribute the to people.

1986	The Government provide the Agriculture land to manage themselves with
1988	The wild fish got disease especially snakehead.
1990	Fishing by used scoop net and wild fish were reducing.
1993	People go to the National election
1996-97	Natural disaster drought and the rice production very low. For the food consumption people sell their own properties to exchange the cassavas from Viet Nam in Samrong commune and that time most of people got poison.
1998	The national election. The wild fish got disease.
2001	The villages have a good school for the children (supported by Japanese organization). For the rice farming farmer can use chemical fertilizer and the rice yield so lower also reduced of wild fish. Most of species got disease like snakehead, catfish, three sport gourami, eel,...

Mapping social context of the village

In general the village was selected because it represent the backward status in terms of village economic status. Majority of the villagers are relatively poor however during the well-being ranking exercise, the villagers used different criteria to determine the well-being of the villagers. From the village headman and a couple, they believe that the village can be divided into four groups but five in the perception of group of women.

Socio economic characteristics

Land ownership. The most important criteria in determining the well-being of the villagers. Land is directly link to the main source of income in the village therefore limitation in the land area own will lead to low income also. The poorer group in this village has land of about 0.5 to 1 hectare of land however are some families on the extreme that do not own land. The middle group where majority of the villagers belong to has an average land of 1.5 to 3 hectare. A maximum of 5 hectares of land is for better family in this village.

Source of income. Generally rice cultivation is the source of income of most of the villagers in the village regardless of the social strata they belong. Secondary sources of income may differ in different social strata. Farmers belonging to the poor group may get income from helping other farmers in planting their rice or doing other agricultural works. Both the middle and the poor group can work as helper as additional source of income. Better off families can get additional income from non-farming activities like weaving, making wine, offering services etc.

Livestock. The number of livestock can also be use in classifying the economic status of the farmers in the village. In general most of the farmers belong to poor family do not own or have limited livestock. It's either farmers have sold it already or they really cannot afford to buy livestock because they do not have land to cultivate using livestock. Poor families may own 1 - 2 heads of livestock, commonly cow, and better off families can have more than 4 since they can use it as additional source of income by providing it for other farmers to be used in land preparation.

Food supply. Due to limited area for rice cultivation, most families belong to poor group do not have enough production to supply their food requirement. Availability of food in poor group is only last for 3 - 4months in a year. Better of families have generally enough production therefore do not have food limitation during lean season.

House material. Material for housing can be used also in determining the well-being of farmers in the village. The use of clay and leaves are very common in poor families will weave leaves, wood, and cement tiles are the materials commonly used by better off families and even the middle group.

Access to credit. Most families in this village has access to credit. They uses their land as collateral and this is the reason why some farmers do not have land now because they failed to payback their loans. There is no formal lending organization in the village that villagers can have access to.

Transport. Bicycle and motorbikes are the most common form of transport in the village. Most of the families in the village have at least bicycle however some farmers particularly those belong to poor group might not own even a bicycle. Middle group and better-off usually use their motorbike in transporting their product to the district market or nearby village. Please see detailed characteristics of each group from **Table 3**.

Table 3 Well-being ranking in Beoung Village

Group of women	Couple	Village Chief
<p>I</p> <ul style="list-style-type: none"> House made from clay with leaf roof Small land 0.5-1ha Food consumption enough just only 3-4 months used their land As collateral Work As helper Selling livestock and fishing for food <p>Consumption Limit of livestock I-2 but mostly don't have</p>	<p>I</p> <ul style="list-style-type: none"> House made from clay with leaf roof Small land 0.5-1ha Food consumption enough just only 3-4 months used their land As collateral Work As helper Selling livestock and fishing for food <p>Consumption Limit of livestock I-2 but mostly don't</p>	<p>I</p> <ul style="list-style-type: none"> House made from clay with leaf roof Small land 1-1.5ha Get debt from (group 4) Enough food for 4months Work As helper Selling livestock and fishing for food <p>Consumption</p> <ul style="list-style-type: none"> Limit of livestock I-2 but mostly don't have Average of 4 children
<p>II</p> <ul style="list-style-type: none"> own land 2-3ha Not enough food 2 livestock Small house made from palm tree, bamboo with leaf roof Transportation with bicycle Making wine, mats for selling 	<p>II</p> <ul style="list-style-type: none"> House made from clay, bamboo with leaf roof Own land 1-2ha No enough food Selling fish Work As helper 	<p>II</p> <ul style="list-style-type: none"> House made from clay with leaf or GI sheet roof Small land 1-1.5ha Get debt from (group 4) Enough food for 10months Use chemical fertilizer 1-2 sack/ha Work As helper Limit of livestock 2-4 Average of 4 children Appliance like TV Operating a rice mill, water pump
<p>III</p> <ul style="list-style-type: none"> House with leaf or tiles Own land 2-3ha 	<p>III</p> <ul style="list-style-type: none"> House made from clay with leaf roof 	<p>III</p> <ul style="list-style-type: none"> House made from clay with leaf roof

<ul style="list-style-type: none"> • Not enough food • 2-3 livestock • Can use chemical fertilizer • Transportation with bicycle, motorbike • Appliance like TV, cassette player, radio • Operating a water pump 	<ul style="list-style-type: none"> • Small land 2-2.5ha • Enough food for whole year • used their land As collateral • Work As helper • With motorbike Consumption 	<ul style="list-style-type: none"> • Small land 1-1.5ha • Get debt from (group 4) • Enough food for 4months • Work As helper • Limit of livestock 2-4 • Average of 4 children • Making wine for selling
<p>IV</p> <ul style="list-style-type: none"> • House with tiles roof • Own land 3-4ha • Enough food for whole year and selling • Appliance like TV, cassette player • Transportation with bicycle, motorbike • Operating a rice mill • Use chemical fertilizer 3-4 sack/ha 	<p>IV</p> <ul style="list-style-type: none"> • House with tiles roof • Own land 4-5ha • Enough food for whole year and can selling • 2-3 livestock • Appliance like TV, cassette player • Transportation with bicycle, motorbike • Operating a rice mill <p>Use chemical fertilizer 3-4 sack/ha</p>	<p>IV</p> <ul style="list-style-type: none"> • House with tiles roof • Own land 3-4ha • Enough food for whole year and selling • Provide rice As credit • Appliance like TV, cassette player • Transportation with bicycle, motorbike • Operating a rice mill <p>Use chemical fertilizer 3-4 sack/ha</p>
<p>V</p> <ul style="list-style-type: none"> • House made from bride with GI sheet • Own land 4-5ha • Enough food for whole year and can sell • 2-3 livestock • Transportation with bicycle, motorbike • Operating a rice mill, generator • Appliance like TV, cassette player, speaker 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

Activity Profile of the village

The diversity of the livelihood in the village is a little bit wide. The number of important activities ranges from 6 to 9 economic and non-economic activities. However, only one or two activities from non-economic activities were considered important to the village. The main activity in the village is agriculture and that is why rice cultivation ranked number one in all four groups during the ranking of important activities. In most cases the number beans allotted to rice cultivation were almost half of the total scores. Aside from rice cultivation, livestock rearing and planting other crop were the top most important aquatic animals followed by a non-economic activity, which is housework. Fishing was also ranked as one of the most important.

Between social strata, the first three main activities (rice, livestock and cropping) have the same ranking but they have different ranking with fishing. For the rich group, fishing was not so important that they gave a very low ranking (by women)

while for the poor group in this village, fishing ranked fourth in the over all activities they do.

The priority of women also differs from men in terms of livelihoods. For men, again rice cultivation, livestock, cropping, and fishing are the most important activity. For women, it is also rice cultivation, which is the most important but housework was added to the list, which ranked number 4 from the list. There are no differences between the numbers of activities of men as compared to women in general but the composition of work. Most of the activities of men need more labor force while women activities can be done in or near their houses.

Table 4 Summary of important activities in the village

Socio-econ group	Gender			
	Men	Women		
Rich	Rice production	(80)	Rice production	(118)
	Livestock	(46)	Cropping	(49)
	Cropping	(23)	Housework	(39)
	Carrying soil	(12)	Handicraft*	(37)
	Fishing	(10)	Looking after child*	(37)
	Collect wood	(10)	Livestock	(36)
	Carpentry	(10)	Wage labor	(26)
	Making wine	(5)	Fishing	(9)
	Selling rice	(2)	Making wine	(2)
	Wage labor	(1)		
Poor	Rice production	(38)	Rice production	(65)
	Livestock	(26)	Livestock	(31)
	Fishing	(15)	House keeping	(25)
	Cropping	(9)	Wage labour	(24)
	Palm production	(7)	Making mats	(22)
	Collect wood	(4)	Fishing	(21)
			Collect wood	(20)
			Cropping	(20)
		Selling	(13)	

Seasonality

Weather

In general, there are two distinct seasons in the village as well as in the province, the rainy or wet season and the dry of hot season. Hot season is the longest season in the village. Even the rainy season already started the weather in the village is still warm. For the poor men group, the whole year is hot weather. Poor women did not mentioned if the rainy season is hot or cold weather. Both rich men and women experience cold weather especially at night during the months of December and January. At the end of February until May, the temperature in the village is very warm.

Social events

Social festivals are activities that describe the culture and tradition of the villagers. All groups are celebrating these activities particularly if it is related to their religion and beliefs. However not all groups have the same festival being celebrated. Among the four groups, only the group of rich women has the most number of activities whole year. It is only in June that rich women do not have any festival or social activities. Both poor men and women celebrate religious activities and those related to the season in agriculture like plowing, planting and harvesting. Some groups also pray for water during the dry season for them to start rice-field ploughing.

Economic activities

Although traditionally women are working the whole year for household activities, in this village the group of women also identified/enumerated the different economic activities that they do and how the season affects these activities.

Table 5 Summary of important economic activities in the village

Socio-econ group	Gender	
	Men	Women
Rich	Rice production Livestock Cropping Making wine Making mats Garment factory Construction worker Fishing Collect wood Wage labor Trading	Livestock Cropping Construction worker Rice production Fishing Wage labor Weave mats
Poor	Rice production Process palm juice Fishing Livestock Collect wood Make farm equipment Construction worker Selling Cropping Collect fertilizer Wage labor	Livestock Rice production Wage labor Selling Collect wood Fishing Cropping Weave mats Collect Fertilizer

The villagers have diverse livelihood in this area as presented in the table and in the seasonal calendars (annexes). However these different activities are being done in different time of the year. Some major economic activities are not seasonal but others depend on the season. Moreover the seasonality of these economic activities differs from one group in the village to another.

In the group of men there are four main economic activities that are being done for almost the whole year, although not both of the two groups doing it at the same time. Rice cultivation, which starts from April and end in January is one of the important economic activities identified by both rich and poor group. Taking care or livestock production and fishing were the two economic activities that both rice and poor men groups do for the whole year. For cropping and wine making, it's the rich men group who mentioned that they do this for the whole year while the poor men group only do cropping starting December and usually end in April when the area is almost dry. There are some seasonal economic activities that only poor men do like collecting fertilizer (?), collecting palm juice and making fishing gear. These economic activities are being done during their free time in summer. For rich men group like the poor group they also have some economic activities that poor men do not do like making wine, mats, garment factory and paid workers (?).

The seasonality of the different economic activities of women was also presented in annexes - Seasonal calendars. The seasonality of the economic activities between socio-economic group has not much difference but the number of activities. Among the listed economic activities in table on the summary of economic activities, the groups of women had identified three major activities that they normally do for the whole year. Livestock production and looking after was identified by the two female groups that they do for the whole year. However, poor group mentioned collecting wood and trading as whole year economic activities. Rice production, cropping and fishing were identified as seasonal activities since all of these activities depend on the availability of water.

Most of the farmers are busy starting the month of May since some of the farmers are already starting to prepare their rice fields. From the time of land preparation to harvesting, most of the farmers are busy. Months that has higher income usually during the harvesting season of rice.

Health.

There are some problems with the health of poor men in this village. Cases of tuberculosis are observed from poor men group. Aside from this sickness, the villagers in general are healthy and no other epidemic that occurred in the village. During April and May, which is the time when weather is very unpredictable, some of the villagers get flu, colds and fever. There are also some cases of flu from November to January in all groups.

Migration.

Moving out from the village at the end of rice cultivation is very common to all groups in the village especially from the young and middle age groups. For poor men, they started to go to Phnom Penh to work in construction from February until May or sometimes until there is no rain. People that work outside the village will start returning when they are about to start planting rice. Other women group would move to Phnom Penh to work in garment factories or better off families as helper.

Role of Aquatic Animals

Villagers have their own reason why they go out to collect aquatic animals. There are some farmers that need not to go out to get aquatic animals, in some cases relatives or friends just provide AA to them. In ranking the importance of aquatic animals to the villagers, the farmers listed criteria that they used why they consider the AA important to them. Most of the criteria relate to two main roles of AA, which are food supply and income (see Table 6).

Food supply. Although taste and family consumption did not ranked the highest criteria, they are still one of the most important to the villagers. Good processing was also used to ranked the importance of AA by the villagers. Most of the aquatic animals being harvested or collected by the villagers were intended for family consumption it not for selling. Most women and children would go to aquatic systems like ricefields and ponds to collect small aquatic animals for them to have meal for the day or for a few days and they will go back "fishing" when their supply of AA runs out.

Income. Often income becomes secondary benefit from collecting aquatic animals by most of the villagers, although there are farmers that really collect aquatic animals to sell. They use the income to buy their other needs. The criteria that relates to income in that farmers used in ranking the importance of aquatic animals is high value. This criteria did not ranked very high during the activity.

Table 6 Summary of important criteria in ranking AA importance

Socio-econ group	Gender			
	Men		Women	
Rich	Abundant	(64)	Abundant	(48)
	Availability	(60)	Good processing	(40)
	Good processing	(36)	Easy to catch	(30)
	Taste	(24)	Taste	(29)
	Easy to catch	(17)	Family consumption	(29)
			Availability	(25)
Poor	Availability	(39)	Abundant	(38)
	Taste	(32)	Taste	(33)
	Easy to catch	(30)	Good processing	(29)
	High value	(29)	Easy to catch	(28)
	Bone	(26)	High value	(26)
	Good processing	(24)	Bones	(26)
	Fishing consumption	(20)	Family consumption	(22)

The importance of aquatic animals also differs between groups in the village. In general villagers considered the AA is important if it is abundant in the systems. The AA may also be consider important if it can be process and keep for a long time for the villagers have sure food during lean season or villagers need not to go regularly to collect AA. Between social strata, the importance of AA is different between rich and poor. The poor group gives more importance to AA if it has a good taste, can be easily caught and high value. Rich group did not use high value as criteria for ranking the importance of AA. There was not much difference between the criteria used by men and women.

Important aquatic animals

In general the freshwater aquatic animals in the village is still diverse. The numbers of important aquatic animals identified by the different groups were not the same. The rich women group has the shortest list of aquatic animals (13 species) that are important to them. The poor men have the longest list of aquatic animals in the villages with a total of 20 species. A total of 22 species were identified during this exercise.

Among the top most important AA in the village, none of the species are stocked and most of them are fishes. There were only about three non-fish species identified as important like the shrimp, frogs and snakes. Topping the list of aquatic animals in the villages are snakehead, rasbora, catfish, climbing perch and shrimp.

The ranking of aquatic animals between groups are not totally the same in the village. In between social strata, like in the poor group for example, they give more importance to non-fish species like snake and freshwater eel, which both did not appear in the list of rich group. Between men and women, differences between the ranking of some species also not the same as presented in **Table 7**. Three spot gourami and snake were also not mentioned by the men group as important but women.

Table 7 Summary of important AA in the village

Socio-econ group	Gender	
	Men	Women
Rich	Snakehead (35)	Snakehead (31)
	Catfish (28)	Climbing perch (24)
	Rasbora (23)	Frog (24)
	Climbing perch (20)	Rasbora (22)
	Pygmy gourami (20)	Small shrimp (19)
	Small shrimp (15)	Catfish (17)
	Whisker feather fish (12)	
Poor	Frog (14)	Three spot gourami (22)
	Snakehead (13)	Snake (21)
	Climbing perch (12)	Rasbora (21)
	Catfish (12)	Snakehead (18)
	Grey featherback (12)	Freshwater eel (17)
	Small shrimp (11)	Pygmy gourami (16)
	Whisker sheatfish (11)	Spiny eel (15)
	Rasbora (11)	
	A. Bony tongue (11)	

Sources of aquatic animals

Different groups have different sources of aquatic animals. There are aquatic systems that are common source of aquatic animals between the four groups and these are: rice fields, which are common to everyone during rainy season; lake, and trap ponds. For poor men, there are other sources of aquatic animals like canal, small stream and

village pond. Rich men and women also collect aquatic animals from small stream and canals. Poor women are limited only with three sources of aquatic animals, which are rice fields; trap ponds; and lake.

Gear used

Among the four groups, poor men have the various fishing gears being used. Poor women like the sources, they also have limited fishing gear being used. Poor women uses gill net; hook long line; trap net; oblong trap; through; and bamboo trap.

List of fishing gears being used

Hooks	-	poor men
Spears	-	poor men
Feed trap	-	poor and rich men
Trap net	-	all groups
Lighting	-	poor men
Hard trap	-	poor and rich men; rich women
Scoop net	-	poor men and rich women
Hook long line	-	all groups
Screen net	-	poor and rich men
Oblong trap	-	poor men and women, rich men
Gill net	-	all groups
Cast net	-	poor and rich men
Jump trap	-	poor and rich men; rich women
Bamboo fence	-	poor men
Trough	-	poor and rich women
Bamboo trap	-	rich men and women; poor women

Seasonality of Aquatic Animals

Most of the aquatic animals in the village are abundant during the rainy season however there are some species that are already declining in population. For poor men, most of the important aquatic animals are either moderately abundant or scarce. There are three species (climbing perch, grey feather back, and small shrimp) that poor men believe that scarce for almost 9 months in a year but still important to them. For the rich men, the above discussion contradict because most of the important species of rich men are abundant apart from rasbora and small shrimp. In rich women group, most of the important aquatic animals are scarce from February until May which is the dry season and abundant from June. June is the start of the rainy season or this is the time when most of the rice fields have water. With the poor women, most of the aquatic animals are scarce the whole year and become abundant only during the peak of rainy season.

Trends of Aquatic animals

The trend of aquatic animals was discussed during the PRA. Participants looked at the status of aquatic animals from 1960 until 2001. At the beginning most of the important aquatic animals are abundant. Most of the aquatic system and natural environment are in good condition. Also during the Polpot regime were most of the people are scared and cannot go out for fishing, the aquatic animals were very much abundant.

It was only later 1993 when the aquatic animals started to decreased it's population. There are a lot of factors associated with the decreasing trend of most of the aquatic animals.

The increasing population is one of the main factors. Due to the increasing population, the demand for aquatic animals as food increases, the number of fishermen increased and the fishing gear started to develop. Intensification of agriculture activities also brought a negative effect on the population of aquatic animals in the environment particularly from the wild aquatic animals that can be collected from rice fields and lakes.

Farmers' meeting

Validating and feed-backing is one of the most important part of this activity. After the two days collection of different information about the village in general and aquatic systems in particular, the staff summarized the information and collated it. A small meeting was then held by combining all the participants together and cleared some information, which are contradicting from one group to another. Both facilitating group and the farmers expressed their experience in doing the exercises and how the information can be use.

Annexes

Seasonal Calendar

Weather

Poor men

April	May	Jun	Jul	August	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Hot, cloudy	Hot, cloudy, a little rain	Hot, cloudy, some rain	Hot, cloudy, some rain	Hot, cloudy, some rain	Hot, cloudy, some rain, flooding	Hot, cloudy, some rain, flooding	Hot, a little rain	Hot, a little rain	Hot, a bit rain	Hot, a bit rain	Hot

Poor women

Hot, cloudy, dry	Rain	Rain	Rain	Rain	Rain, flood	Rain, flood, windy	Windy	Nothing	Nothing	Hot, dry	Hot, dry
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Rich men

Very hot	Warm, windy	a bit rain, windy, lightning	A lot of rain at beginning or month, little at end.	Warm, dry	A lot of rain	a bit rain, windy	Occasional rain, strong wind	Occasional rain, cold wind	No rain, hot during the day, cold at night	Dry, hot	Dry, hot
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Rich women

Hot	Thunder, lightning, a little rain, gales	Thunder storms, gales, a little rain	Dry, a little rain	Dry, a little rain	Rainy season	Rainy season	Rainy season, cold season	Cold season	hot	hot	hot
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Social events

Poor men

April	May	Jun	Jul	August	Sept	Oct	No	De	Ja	Fe	Mar
Khmer New year, praying ceremony, offering for the dead	Construction ceremony, small ceremony in house for monks		Celebration of rainy season		Phchom Ben	End of rainy season	Kathanatien ceremony	Flower ceremony	Ceremony in the village for monks, wedding ceremony	Wedding ceremony	

Poor women

Khmer New year	Visakh Bochea	praying for water			Phchom Ben	Kathanatien	Kathanatien ceremony, Full moon -Water festival ceremony			Meakh Bochea, flower ceremony	
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Rich men

Khmer New year	Visakh Bochea	Praying for water	Celebration of rainy season		Phchom Ben	End of rainy season	Kathanatien ceremony				
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Rich women

April	May	Jun	Jul	August	Sept	Oct	No	De	Jan	Fe	Mar
Khmer New year, wedding ceremony	Visath Bochea, Wedding ceremony		Celebration of rainy season	Celebration of rainy season	Celebration of rainy season Phchom Ben	End of rainy season, wedding ceremony	Wedding ceremony	Wedding ceremony	Wedding ceremony, flower ceremony	Wedding ceremony, Meakh Bochea, offering to the monks	Wedding ceremony, flower ceremony, offering to the monks

Economic Activity

Poor men

April	May	June	July	August	September	Oct	Nov	Dec	Jan	Feb	Mar
Collect fert, rice production Process palm juice, crop prod. Fishing, livestock, collect wood, make farm equipment, construction work, seller	Plowing, rice production, fishing, livestock, collect wood, make farm equipment, construction worker, seller	Sowing rice, rice production, fishing, livestock, collect wood,	Rice production, fishing, livestock, collect wood	(no rain) Rice production, plowing, fishing, livestock, collect wood	Rice production, transplanting, fishing, livestock, collect wood	Rice production, fishing, livestock, collect wood	Rice production, fishing, livestock, collect wood	RF maintenance, palm juice, crop production. Fishing, livestock, collect wood	Harvesting rice, palm juice, crop production. Fishing, livestock, collect wood, worker.	Palm juice, crop production, fishing, livestock, collect wood, worker, seller	Palm juice, crop production, fishing, livestock, collect wood, worker, seller

Poor women

Livestock, rice production, worker, seller, collect wood,	Collect fertilizer, collect wood, fishing, livestock, worker, seller, crop production	Plowing, Crop production, fishing, livestock, worker, seller, collect wood	Plowing, transplanting, fishing, livestock, worker, seller, collect wood	As previous	As previous	Fishing, livestock, weave mats, seller, collect wood	As previous	Harvesting and storing rice, fishing, livestock, weave mats, seller, collect wood	As previous, but no fishing	Livestock, weave mats, seller, collect wood	As previous
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Rich men

Livestock, crop production, making wine, work in garment factory, construction, fishing, making mat, collect wood, selling rice, worker	Livestock, plowing, crop production, making wine, garment factory, fishing, make mats	Sowing rice, livestock, crop production, make wine, fishing	RF maintenance, livestock, crop production, making wine, fishing	Transplant rice, livestock, crop production, making wine, fishing	As for August, but a lot of fishing	RF maintenance, livestock, making wine, crop production, lots of fishing	Harvesting first rice, livestock, crop production, making wine, lots of fishing	Harvesting third rice, livestock, crop production, make wine, fishing, make mats, collect wood, seller	Livestock, crop production, make wine, garments, worker, fishing, make mats, collect wood, seller	As for January	As for January
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Rich women

Livestock, crop production, construction worker	Plowing, livestock, crop production	Sowing rice, livestock, crop production, fishing	Fertilizing, livestock, Transplanting, fishing, crop production	Transplanting, livestock, crop production, fishing, worker	Fertilizing, transplanting, crop production, livestock, plentiful fishing, worker	As previous plus make mats	Fertilizing, harvesting rice, livestock, making mats, fishing	Harvesting rice, livestock, fishing	Harvesting, livestock, prepare trap ponds	Livestock, prepare trap ponds, construction worker	As for February
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Income/Busy months

Poor men

April	May	Jun	Jul	August	Sept	Oct	Nov	Dec	Jan	Feb	Ma
Income from livestock	Busy RF maintenance	Busy RF maintenance	Busy RF maintenance					Income from rice production	Very busy, harvesting rice		Income from livestock

Poor women

	Busy transplanting	Busy transplanting	Busy transplanting	Busy transplanting	Busy transplanting			Income from harvest and livestock	Income from harvest		
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Rich men

	Busy	Busy	Busy	Busy	Busy	Busy	Busy, income	Busy, income			
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Rich women

	Busy	Busy	Busy	Busy	Busy	Busy	Busy	Income from rice	Income from rice		
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Health

Poor men

April	May	Jun	Jul	August	Sep	Oct	Nov	Dec	Jan	Feb	Ma
Fever, stomach problems	Normal	Normal	Normal	Normal	Happy	Flu, TB	Flu, TB	Flu, TB	Flu, TB	Flu, TB	Fever, stomach problems

Poor women

Fever, stomach problem, cough, flu, malaria, high blood pressure, asthma	As April	As April					Flu	Flu	Flu	Flu	
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Rich men

Fever, stomach problem							Flu				Fever, stomach problems
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Rich women

Stomach problem, cough, swollen stomach, fever	Fever						Flu, fever	Flu, fever			Swollen stomach, stomach problems, cough, fever
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Migration

Poor men

April	May	Jun	Jul	August	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Worker in PP	Worker in PP									Construction worker in PP	Construction worker in PP

Poor women

Came back from PP	Come back from PP									Go to PP, construction worker, garment factory, moto driver.	As previous
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Rich men

Line									Line (maybe go to PP?)	Line	Line
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Rich women

Change place to live in PP										Change place to live in PP	Change place to live in PP
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Activity Scoring

Rich men

Activity	Farmer Name									
	Bang An	Khim Son	Uy Yan	Khan Choun	Pov Phan	Thov Nat	Kol Chea	Phoung Narin	Pal Yun	Neang Ouk
Rice production	7	6	10	10	10	11	8	4	7	7
Livestock	7	5	0	0	9	7	6	5	4	3
Crop production	4	5	0	0	0	0	6	3	3	2
Make wine	0	0	0	0	0	0	0	2	2	1
Selling rice	0	0	1	0	0	0	0	0	0	1
Fishing	0	1	4	0	0	0	0	3	1	1
Carry soil	0	1	0	10	0	0	0	0	0	1
Find wood	0	1	3	0	0	0	0	2	2	2
Worker	0	0	0	0	0	0	0	0	0	1
House builder (wood)	2	1	2		1	1		1	1	1

Rich women

Activities	Farmer Name																
	Sim Phally	My Yan	Kol Vun	Khim Roeun	Am Savun	Pal Sim	Im Ang	Chea On	Tep An	Mey Yan	Chim Sam At	Kim Pheng	Haim Saran	An Chanra	Kol Sok	Sam Neak	Gnoun Somaly
Rice production	8	7	7	7	8	6	7	7	7	7	7	6	7	6	8	8	5
Livestock	2	1	4	3	3	3	4	0	2	0	2	2	2	2	2	2	2
Plant crop	3	5	2	3	2	3	2	4	2	4	3	3	3	4	2	2	2
Handicrafts	3	4	1	2	1	2	2	3	2	3	2	2	3	2	2	2	1
Fishing	1	0	0	1	1	0	0	0	0	0	0	0	1	2	2	1	0
Worker	0	5	2	0	2	0	2	1	2	0	2	2	0	1	2	2	3
House worker	3	3	2	2	1	3	3	2	2	3	3	3	3	2	1	1	2
Look after child	1	2	1	2	1	3	1	2	2	3	1	2	7	1	1	2	5
Make Wine	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0

Poor women

Activities	Farmer Names												
	Orn Nary	Sao Han	Yos Mot	Thao Noun	Chan Son	Sim Samol	Mom Phy	Has Saroeun	Chan Ea	Lim Puth	Kong Tit	Am Lang	
Rice production	5	7	9	7	5	7	7	5	2	3	5	3	
Livestock	2	3	3	2	1	3	2	3	4	2	3	3	
Fishing	1	1	2	2	3	1	1	3	1	2	1	3	
Worker	1	1	0	0	2	2	2	2	4	4	4	2	
Make mats	2	1	2	4	2	2	3	2	0	2	1	1	
Crop production	2	2	2	2	2	3	1	1	0	3	1	1	
Seller	0	0	0	0	0	0	0	0	6	0	3	4	
Find wood	3	2	1	1	3	1	2	2	0	3	1	1	
Housekeeping	4	3	1	2	2	1	3	2	3	1	1	2	

Poor men

Activities	Farmer Names				
	Chean Sey	Chin Sitha	Kong San	Thai Soy	Kol Ol
Rice production	6	8	9	8	7
Palm juice	4	3	0	0	0
Find wood	0	0	4	0	0
Fishing	4	2	2	3	4
Livestock	5	7	5	4	5
Crop production	0	0	0	5	4

Aquatic Animal Identification and Scoring

Poor men

Species	Characteristics						
	Available	Easy to catch	Processing	Taste	Value	Bones	Consumption
Catfish	3	1	2	2	2	1	1
Spiny eel	2	1	1	2	2	1	1
Climbing perch	2	2	1	2	2	2	1
Snakehead	3	2	2	2	2	1	1
Three spot gourami	1	2	1	1	2	2	1
-Lobster	3	1	0	2	0	2	1
Grey feather back	2	2	2	2	1	2	1
Frog	3	2	2	2	2	2	1
Asian Bony tongue	3	2	1	2	1	1	1
Small shrimp	3	2	1	2	2	0	1
Whisker sheatfish	2	2	2	2	1	1	1
Rasbora	1	2	2	1	2	2	1
Crab	0	2	1	1	2	2	1
Catopra	1	1	1	1	1	2	1
“Kchoeung”, Mastacembelus spp.	2	1	1	1	1	1	1
Fresh water eel	1	0	1	2	1	0	1
Mystus	1	1	1	1	2	2	1
Yellow mystus	2	1	1	1	1	1	1
Snail	2	2	0	1	2	0	1
Great white sheatfish	2	1	1	2	0	1	1

Poor women

Species	Criteria						
	Taste	Value	Bones	Processing	Family consumption	Abundant	Easy to catch
Spiny eel	2	2	2	3	2	3	1
Pygmy gourami	3	1	4	2	2	1	3
Grey feather back	1	4	2	2	0	2	1
Three spot gourami	3	3	3	3	3	4	3
Freshwater eel	2	1	1	3	2	4	4
Snake	4	2	2	3	3	4	3
Crab	2	1	2	2	2	2	1
Climbing perch	1	1	1	1	1	2	2
Snakehead	4	3	2	3	2	3	1
Rasbora	4	3	1	3	2	5	3
Catfish	1	1	2	1	0	3	2
Mystus	3	1	1	1	0	1	1
Frog	1	1	1	0	1	2	1
Whisker sheatfish	1	1	1	1	1	1	1
Small shrimp	1	1	1	1	1	1	1

Rich men

Species	Criteria				
	Abundant	Easy to catch	Taste	Processing	Available
Crab	2	2	0	0	0
Snakehead	12	2	3	5	13
Climbing perch	5	2	3	3	7
Spiny eel	3	1	2	4	0
Catfish	8	1	2	7	10
Whisker sheatfish	4	1	2	2	3
Three spot gourami	3	1	0	3	2
Frog	4	1	2	0	3
Small shrimp	4	1	2	4	4
Pygmy gourami	4	1	2	4	9
Freshwater eel	3	0	1	0	0
Snail	2	0	1	0	0
Mystus	3	0	0	0	0
Rasbora	4	4	2	4	9
Yellow mystus	3	0	2	0	0

Rich women

Species	Criteria					
	Processing	Family consumption	Abundant	Taste	Available	Easy to catch
Snakehead	4	4	6	7	7	3
Catfish - in the rice field -used hook, lighting	5	2	4	2	2	2
Frog -in in the rice, ditch -used lighting	4	5	5	3	4	3
Small shrimp -in trap pond, rice field -used screen net	7	4	3	2	1	2
Climbing perch - in trap pond -used gill net, net, lighting	5	4	6	3	2	4
Spiny eel -in the rice -used screen net, lighting, gill net	1	1	1	3	2	2
Whisker sheatfish - in the rice field, trap pond used drag net, dry up, lighting	1	1	1	1	1	1
Three-spot gourami - in the rice -used dry up, lighting, hook line	3	1	4	1	0	1
Rasbora - in the rice, trap pond -used oblong trap, drum trap, drag net	5	2	7	2	1	5
Freshwater eel -in trap pond -used dry up	1	1	1	2	1	1
Mystus -in the rice -used drag net	1	2	1	1	1	1
Crab - in the rice -used scooping, hook	1	1	7	1	1	4
Snake - in the rice -used oblong trap, lighting	2	1	2	1	2	1

Seasonality of Aquatic Animals

Poor men

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Frog	Scarce, in RF, dig, hook	Scarce, in RF, dig, hook	Abundant, in RF, spears, lighting,	Abundant, in RF, spears, lighting	Abundant, in RF, spears, lighting	In RF, hook long line	In RF, hook long line	In RF, hook long line	In RF, hook long line	In RF, hook long line	In RF, hook long line	Scarce, in RF
Snakehead	Scarce, spears, feed trap, trap net, lighting, in rice field	As previous	Moderate, feed trap, trap net, hard trap, lighting, hook long line, line, in lake, and RF	As previous	As previous	As previous	Abundant, trap net, feed trap, hard trap, in RF, lake	As previous	As previous	As previous	Moderate, draining trap pond, in RF, lake, and household pond	Scarce, in RF, spears, feed trap, trap net, lighting, in rice field
Climbing perch	Scarce, draining trap pond, in RF, lake	As previous	Abundant, screen net, oblong trap, lighting, in RF,	As previous	Scarce, feed trap, trap net, cast net, in RF	As previous	As previous	As previous	As previous	As previous	Scarce, draining trap pond, in RF, lake	
Catfish	Scarce, in lake, feed trap, hard trap	As previous	Moderate, lighting, spears, line, hook long line, gill net, in RF	As previous	As previous	As previous	As previous	Abundant, lighting, spear, jump trap, in RF, lake	As previous	Moderate, lighting, spear, line, in RF, lake, trap pond, in village pond	As previous	Scarce, in lake, feed trap, hard trap
Grey featherback	Abundant, feed trap, trap net, in lake, canal	Abundant, feed trap, trap net, in lake, canal	Scarce, trap net, feed trap, in RF, small stream, canal,	As previous	As previous	As previous	As previous	As previous	As previous	As previous	As previous	Abundant, feed trap, trap net, in lake, canal
Small shrimp	Scarce, scoop net, scooping net, in lake, canal, RF	As previous	As previous	As previous	As previous	As previous	As previous	Abundant, oblong trap, bamboo fence trap, scoop net, in RF, small stream	As previous	Scarce, scoop net, in lake, canal, RF	As previous	As previous

Rich men

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Moderate, draining trap pond,	Not rich (Moderate) lake, canal, hard trap, feed trap	Moderate, lake, canal, RF, hard trap, feed trap	Abundant (abundant fingerlings) In rice field, trap net, cast net	Abundant RF, lighting	Abundant, RF, lighting	Abundant RF, jump trap, small oblong trap, gill net	Abundant, RF, jump trap, line, gill net	Abundant In trap pond, line, draining trap pond	Abundant in trap pond, draining trap pond	As January	As January
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
Rasbora	Scarce, cast net in canal	Scarce, cast net in RF, canal	Scarce, in ditch, RF	Less abundant, RF, ditch, trap pond, cast net	Moderate, lots of rain, ditch, mosquito net, small stream	Very abundant, in RF, fine mesh net	As previous	As previous	Scarce, in trap pond, trap net, draining	As previous	As previous	As previous
Climbing perch	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above	As snakehead above
Small shrimp	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above	As Rasbora above
Whisker feather fish	Moderate, in trap pond, draining, cast net	Scarce, line in canal	As May	As May	As May	Moderate, in RF, trough bamboo trap, line, gill net	Abundant RF, trough bamboo trap, line gill net	As previous	Abundant, draining trap	As previous	As previous	As previous

Rich women

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Scarce, draining trap pond	Scarce, draining trap pond	Nothing	Nothing	Abundant, small stream, RF, lighting, hook long line, jump trap, hard trap.	As August	As August	As August	As August	As August	As August	Scarce, draining trap pond
Climbing perch	Scarce, drain jump trap,	Nothing	Abundant Scoop net, bamboo net, trough bamboo trap, lighting, hook long line, hard trap, gill net, small canal, in RF, small stream,	As June	As June	As June	As June	As June	As June	Moderate, As previous	Scarce, drain jump trap,	Scarce, drain jump trap,
Frog	Nothing	Abundant Lighting, hook long line, in RF, forest, shrub	As May	As May	As May	As May	As May	Moderate, hook long line	Moderate, hook long line	Scarce, hook, dig	Scarce, hook, dig	Scarce, hook, dig
Rasbora	Nothing	Nothing	Nothing	Nothing	Abundant scoop net, trough bamboo trap, oblong trap, RF, small stream, trap pond	As August	As August	Moderate, draining, RF and small stream	As November	Scarce, drain trap pond	As January	As January
Small shrimp	As above	As above	As above	As above	Abundant, As snakehead above	As previous	As previous	Moderate, As previous	As above	As above	As above	As above
Catfish	As Snakehead	As Snakehead	As snakehead	As snakehead	As Snakehead	As Snakehead	As snakehead	As snakehead	As Snakehead	As Snakehead	As snakehead	As snakehead

Poor women

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Scarce, -in the rice field, trap pond, lighting, gill net, hook long line, spawn in RF	As April	As April	Moderate As April	As July	As July	As July	Abundant As April	As November	Scarce As April	As January	As January
Climbing perch	Moderate In RF, trap pond, trap net, gill net, hook long line	As April	Abundant As previous	As June	As June	As June	Moderate, As September	As October	As October	As October	As October	As October
Whisker sheatfish	Scarce, in lake, trap pond, RF, hook long line, gill net, trap net	As April	As April	As April	As April	Moderate As April	As September	As September	As September	Abundant As December	As January	As January
Catfish	Scarce, trap pond, RF, lake, lighting, gill net, hook long line	As April	As April	As April	Moderate As previous	As August	As August	As August	As August	As August	As August	As August
Rasbora	Scarce, trap pond, rice field, lake, oblong trap, trap net, net, trough bamboo trap	As April	As April	Abundant As previous	As July	As July	As July	As July	Moderate, As November	As December	As December	Nothing
Grey featherback	Scarce	As April	As April	As April	As April	As April	As April	As April	As April	Moderate, drain trap pond near house	As January	As above

Trends of Aquatic Animals(V6)

Poor woman

Species	1954	1975	1979	1993	2001
Snakehead	Abundant Lake water deep and wide, no trap pond, RF, lake, ditch, a few fishermen, bamboo net, hard trap, feed trap, floating plants	Abundant No fishermen, in lake, RF, ditch, feed trap, trap net, floating plants, spiny pineapple-like plant (rumchay)	Very abundant in lake, low human population, trap net, many floating plant, water deep, few fishermen, lake is wide and deep, many rumchay	Moderate, fish disease, shallow water, cast net, trap net, scoop net, few floating plants, a lot of trap ponds	Scarce, fish disease, cast net, lighting, spear, shallow water in lake
Climbing perch	Scarce, in trap pond, lake, ditch, a lot of ditches, feed trap, trap net, cast net, gill net,	Less scarce, bamboo net, scoop net, in RF, trap pond	Abundant, trap net, hook long line, lighting, few fishermen, RF, lake	Scarce, As 1979	As 1993
Whisker sheatfish	Abundant Trap pond, lake, rice field draining, scoop net	Moderate As previous	Abundant As previous	Scarce, a lot of fishermen, trap pond, lake, RF, trap net, draining bamboo net	Scarce, shallow water in lake, gear As previous
Catfish	Abundant, trap pond, lake, RF, trap net, line, gill net	As previous	As previous, few fishermen	As previous	Scarce
Rasbora	Abundant in the rice field, lake, trap pond, screen net, oblong trap, mosquito net, draining,	As previous	As previous	As previous	As previous
Grey featherback	Abundant, in trap pond, canal, lake, draining, trap net	As previous	Moderate, As previous	Scarce, As previous	As previous

Poor men

Species	1960	1965	1970	1975	1979	1993	2001
Frog	Abundant, Don't catch it, no fishing gear, low human population, lots of forest	As previous	Abundant, Lon Nol regime, people leave the village, no fishermen, lots of forest	Abundant, no fishing allowed, lots of forest	Abundant, no fishing allowed, lots of forest, Pol Pot Regime	Scarce, many fishermen, declining inundated forest, modern fishing gear	As previous
Snakehead	Abundant, few fishermen, deep water in lake, plenty of inundated forest, spawning in lake, RF, ditch,	As previous	Abundant, Lon Nol Regime, women forced to work hard, Regime's army fights women, men forced to join army, people flee the village, no fishermen, deep water in lake, many floating plants, fish can spawn	Abundant, during Pol Pot Regime, no fishing allowed, no fishermen	Abundant, people return to village, start fishing again, many many fish!!	Scarce, many fishermen, modern gear, shallow water in canal, declining inundated forest, fish can't spawn	As previous
Catfish	Abundant, inundated forest, deep water in canal, traditional fishing gear, low human population, feed trap, hard trap, bamboo net, spawning in trap pond, lake, ditch, RF	As previous	Abundant, Lon Nol regime, people forced to labour, leave the village, no fishermen, have forest, deep water in lake	Abundant, no fishing allowed, many many fish!, lots of forest,	Abundant, people return to village, start fishing again, have inundated forest in lake. Deep water in lake	Scarce, many fishermen, declining inundated forest, there is still water in the lake	Scarce, As previous
Climbing perch	As above	As previous	As above	As above	As above	As previous	
Grey featherback	As above	As previous	As above	As above	As above	As previous	
Small shrimp	As above	As previous	As above	As above	As above	As previous	

Rich men

Species	1960	1975	1979	1993	1998-2001
Snakehead	Abundant Hard trap feed trap, line, hook long line, in RF and other waters	Abundant, no fishermen, live communally,	Very abundant, in RF, lake, canal, draining	Moderate, RF, lake, canal, trap net, feed trap, gill net, cast net	As previous
Catfish	As above	As above	As above	As above	As above
Rasbora	Abundant, oblong trap, fine mesh net, drum trap	Abundant, oblong trap, fine mesh net, drum trap	Abundant, bamboo net, draining, oblong trap	Abundant, in RF, trap pond, canal, trap net, oblong trap, drum trap, fine mesh net	Abundant, in RF, trap pond, canal, trap net, oblong trap, drum trap, fine mesh net
Climbing perch	As Snakehead above	As snakehead above	Abundant, trap pond, RF, line, hook long line, gill net	Abundant, RF, lake, canal	Abundant, trap net, feed trap, hard trap, line, gill net, cast net
Small shrimp	Abundant -in rice field, lake trap pond, canal, oblong trap, bamboo trap	Abundant, no fishermen	Abundant, RF, lake, canal, ditch, oblong trap, fine mesh net	Moderate, many fishermen, RF, canal, lake, ditch, small stream, cast net, oblong trap, bamboo net	Moderate, trap pond, canal, lake, cast net, oblong trap, fine mesh net in small stream
Whisker sheatfish	Abundant Rf, canal, lake, ditch, trap pond, hard trap, feed trap, line, hook long line	Abundant No fishermen, RF, canal, lake	Abundant RF, lake ditch, trap pond, no fishermen	Moderate, many fishermen, in RF, lake, ditch, canal, trap net, gill net, cast net, hook long line, feed trap	As previous

Rich woman

Species	1954	1975	1979	1993	2001
Snakehead	Abundant, RF, small stream in forest, bamboo net, hard trap, feed trap	Less abundant Feed trap, hard trap, gill net, trap net, bamboo net, in RF, inundated forest, lighting	Abundant Hard trap, bamboo net, lighting, People catch big and small fish- they don't protect small fish	Moderate, hard trap, bamboo net, scoop net, gill net, trap net, lighting, people catch big and small fish (not protect small fish), in RF	Scarce, scoop net, hook long line, gill net, feed trap, cast net, many fishermen
Climbing perch	As above	As above	As above	Abundant, As above	As above
Frog	Abundant Lighting, hook long line, in RF, shrub, in lake	Abundant No fishermen, communal life	Abundant No fishing gear, lighting, hook, line, can catch big frogs, a few fishermen	Moderate, Lighting, drum trap, hook long line, in RF, Can only catch small frogs	Scarce, lighting, hook long line, in RF, catch small frogs only, many types of gear are used, many fishermen
Rasbora	Abundant, no fishermen, bamboo net, oblong trap, (trough bamboo trap), in RF	As previous	As previous	Moderate, cast net, oblong trap, drum trap, in RF	Scarce
Small shrimp	As above	As previous	As previous	As above, and As previous	
Catfish	As above	As above	As above	As above	As above

