

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

**Participatory Rural Appraisal in Taleak Tbong Village
Case Study 9
(PRA Report from 2001)**

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Taleak Tbong 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 just accept and accommodate the said "intervention". It is therefore necessary to listen to the villagers and to consult them first regarding the status of their area prior to starting any activity, rather than just thrusting information and expectations on them.

Objectives

The main objectives of the study are to assess the general livelihood activities in the village and to establish rapport with the villagers. To achieve these main objectives, the following are the specific objectives:

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

Participatory Rural Appraisal Team

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Schedule of Activities

The workshop was done in three days, which also included the collection of secondary information about the commune (see Table below). During the first day the commune offices were visited. Secondary information was gathered from the office that helped the team identify the village for this study.

Before the village was finally selected validation and additional information were asked from the head of the commune. Visitation of the village was also done during the first day where the team was introduced to the villagers. An appointment was also set during this visit.

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 workshop in Taleak Tbong Village

Date	Activities
July 2, 2001	Visit to Commune
July 3, 2001	Introduction to the village Village profiling
July 4, 2001	PRA workshop Validation

Takeo Province

Province Description

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

Total area : 348.015 Km²

Boundaries:

North :	Kandal province
South :	Vietnam
Eastern :	Kandal province and Vietnam
Western:	Kampong Speu and Kompot province

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

District Description

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

Boundary:

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

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

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

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

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

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

Rainfall. The rain pattern in the area changes every year so it cannot be established. In general the rain comes during the period of May to October.

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

Commune Description

General description. The commune is one of the biggest in the district with a total of 30 villages. The commune has approximately a total of 2,598 families, an average of 86.6 families per villages. The number of families ranges from 32 to 177.

1. Taleak Tbong	140 families
2. Kus Tmey	113 families
3. Tmat Porng	53 families
4. Tuk Tlar	105 families
5. Tropaing Chertiel	61 families
6. Chertiel Tkol	49 families
7. Tunsong Rorv	47 families
8. Ang Krolang	61 families
9. PorngTuk tbong	82 families
10. Porng Tuk chiang	51 families
11. Sen Ork	50 families
12. Chanka Tieng	62 families
13. Ordong Tmor	96 families
14. Neil	66 families
15. Trapaing Lieng	140 families
16. Talek Chieng	139 families
17. Tropaing Pring	177 families
18. Kraing Tachan	116 families
19. Prey Takab	115 families
20. Tropaing Anpil	54 families
21. Tropaing Tasok	86 families
22. Mean Chey	32 families
23. Knach Chor	82 families
24. Ork Porng	73 families
25. Chanka Ang Chieng	88 families
26. Chanka Tbong	85 families
27. Prey Chhnoun	57 families
28. Tamnop Chrey	74 families
29. Ang Ta ngal	95 families
30. Tropaing Tmor	149 families

Selection Process for the Village

The village was selected using the criteria on the status of aquatic resources. In this study the project looked at different aquatic systems and also on the topography of the sites. During the provincial office visit, the district was selected because it is one of the highest areas in the province. From the district a commune was identified by

drawing a transect line throughout the district, traversing the upland to lowland areas, which is also from western to southeastern part of the district. The transect line was divided into three parts and the commune was identified from the three portions of the line: Samrong located in the high and drier area along a mountain, Kus in the intermediate highland area and Nheng Nhang in the wet highland area. Once the commune was selected, a visit to the commune was done to verify some secondary information about the commune. The village was then identified after the meeting with the commune head. Some of the bases used in the selection of the village was the amount of aquatic systems present in the area; being a representative of a backward village (i.e. considered as one of the poor villages); and also the number of households for ease of management purposes. Taleak Tbong was selected as a representative of an area that is in the midland of this district (Tramkok District).

Specific Method Used

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

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

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

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

Activity profile. This activity was meant to identify the common activities in the village and to differentiate the priorities of each group.

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

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

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

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

Process

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

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

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

The last part of the workshop was the validation. The team collated all the information generated from the first two days, the team made summaries of the important issues and presented to the village and had a brief meeting with the villagers to also validate some information.

Setting the Context

Mapping the Current Resources in the Village

Mapping of current resources was done in the village as part of profiling the area. The objective of the activity was to determine the level of understanding and awareness of the key informants and the village headman on the resources available in the village. During the activity the village headman with some key informants discussed what resources are important to the village. After the discussion the participants drew the resources available in the village (see Fig 1). The resources in the village dictate the main livelihood in the area. Below are some of the most important resources that the villagers considered as important and as the source of their livelihood in the village:

Land resource. Based on the village map drawn by the participants it is very evident that land is considered as the biggest resource in the village. It is the most important source of livelihood in the village. Majority of the villagers are farmers and they use the land for rice cultivation. Rice paddies can be seen in the whole village as reflected in the village map. Even though the rice paddy is the main source of income in the village, the area can only be productive during one season in a year.

Water resource. Another resource that was considered important is the water resource available in the village. Although there is no major water system in the village small water bodies also play an important role to the villagers. Community pond, *trapiang*, and reservoir (*Arng*) are some of the community water bodies that are important to them. These aquatic systems are the sources of aquatic animals that villagers commonly consume or sometimes sell for additional income. Aside from the aquatic products, the water from the system also plays a role in agriculture and domestic activities of the villagers.

Physical resource. Most of the basic needs of the villagers are available in the village. Services and other physical resources are present in the area. In the map, the villagers were able to identify other resources like school, police station, pagoda and village rice mills. The road was also recognized as important to the village.

Mapping the Development in the Village

A discussion on the different important events that had happened in the village took place after the facilitator explained the objectives of the activity to the farmers, who were all the old people in the village. The exercise was meant to explore the developments which took place in the village and how the people recognized the importance of each event. This activity also helped the group understand the different factors which affected the development or the situation of the village from past to the present (see Table 2).

Like other places in the country, their history would always include experiences from the different regimes of the country. Most of the information discussed and illustrated in Table 2 are related to political events in the village as well as in the country.

Since 1954 the political situation in the village was not good and was already affecting the villagers' way of life. Because of the insurgency problem, villagers became vigilant and needed to defend their own village. During this period the life of the villagers was not easy. In 1969 to 1970, there was a coup and the people from the government were divided. The Lo Nol regime took power and started prosecuting people that were potential enemies of the government. The years 1973 to 1975 was the most terrible period in the village. Farmers/villagers were not allowed to work as individuals and their properties were confiscated. A community-based production scheme was enforced and the produce or benefits went to the people in power and not to the farmers. In 1979 the Khmer Rouge left the area but stayed in the forest. However the life of the villagers was still not secure since from time to time the Khmer Rouge would go to the village and kidnap people who later were killed. It was only in 1993 when the Khmer Rouge "disappeared" after the national election. At present villagers are living normally with no pressure or threats on them.

Figure 1 Village Map of Taleak Tbong

Aside from the political situation, the economic situation of the villagers was discussed as well during the activities. Even before the take-over of the Khmer Rouge, the life of the villagers was already difficult. Most of the farmers did not have enough food to eat and the health condition was also not in good state. In 1973, since farmers no longer have the rights to their property, the economic situation of the villagers became worse, with families eating together in the community. In 1993 the economic status of the villagers started to improve though up to now, most of the villagers still live below the accepted standards.

The aquatic resources and rice production conditions were also discussed during the historical transect. In 1954, the living aquatic resources were abundant because very few people were living in the community and utilizing the resources in the village. However although it was abundant people did not have full access to the resources and were not even allowed to fish. During the Polpot regime, the fish in the lake started to decrease and the lake became shallow. From 1993 to present, the availability of aquatic animals became less and less due to several factors like increasing number of farmers fishing, the use of modern gears and the growing population.

Table 2. Historical Events in Taleak Tbong Village

Year	Events
1954	<ul style="list-style-type: none"> -This village was called Taleak. -Isarak promoted anti-French feelings and people stayed in the village. -Gunfire in the village; many people (one monk) injured. -Less population, no flood, fish resources are abundant. A lot of with wild animals.
1960	<ul style="list-style-type: none"> -People lived peacefully; they worked in the rice fields and planted crops, but not enough rice to eat. -Some families left the village because there was not enough food to eat.
1965-69	<ul style="list-style-type: none"> -The Royal regime -Khmer Rouge group was established, but no violence to people. -Most people supplied food to the Khmer Rouge. -People didn't see Khmer Rouge in the day. But in the night they enter the village to escape and hide from the army. -People in the village duty to defend by dividing into shifts, they didn't pay a fine. -The village still keeps the name Taleak. -Fish resources were abundant. They fished by using angle, oblong trap, and lighting.
1969-70	<ul style="list-style-type: none"> -Coupe d'Etat King Sihanouk and the management people divided to group. -National Revolutionary group. -Lon Nol regime -Lon Nol not violent to the ordinary people, but they did persecute their enemies. -The National Revolutionary group strict towards the people and would take them away, at the end killed them. People had enough food to eat. Fish resources were abundant. -The village changed the name from Taleak to Taleak Tbong---
1970-73	<ul style="list-style-type: none"> -People worked in the rice field as a community -Khmer Rouge managed people in the village. All teenagers have the duty to be in the army and they were sent to fight. -Fish resources were reduced and small lake became shallow. -Some people had a relationship with Lon Nol regime, Khmer Rouge say that they take people to educate them, but in fact they killed them. -Food was eaten as a community but after three months the community broke down.

	<ul style="list-style-type: none"> -Lon Nol aeroplanes bombed and people lived under ground in shelters. -People did not have enough food to eat and they couldn't leave the shelters to take cows that were killed by bombing because they bombed a lot.
1973-75	<ul style="list-style-type: none"> -Khmer Rouge divided people into three groups: poor farmer, medium farmer, and high farmer. -Eliminated feudal class and killed all the educated people and nominated people for leading. -Established investigators group in the village. -People worked in the rice fields as a community. -On April 17, 1975 liberation in PP. -The people gathered together in one pagoda, Chek Chrum.
1979	<ul style="list-style-type: none"> -Pol Pot regime people ate together as a community and they worked hard from morning to night. -Established worker group by dividing by age ranking. Adults should work harder than others. -People leave the village for another village. -People ate rice soup together as community. -Fish resources were abundant; people did not have the right to go fishing. They worked hard, but had little food and people were killed, like they were livestock.
1989	<ul style="list-style-type: none"> -The civil war made life difficult in the village. -Khmer Rouge kidnapped people until their families pay the ransom. While they stayed in the forest the Khmer Rouge forced them to stop believing in the politics of the Government. -Force people to work for the. -Force people to believe only Khmer Rouge politics. -Fought with Government soldier, they burned the households. -The village changed name to Taleak Tbong.
1993	<ul style="list-style-type: none"> -Still have Khmer Rouge; burning three households and one barrack. -Until National election when the Khmer Rouge disappeared. -Enough food to eat -People have freedom. -Fish resources were reduced; lake is shallow because of they used modern gear.
2001	<ul style="list-style-type: none"> -People healthy and most of them have enough food to eat. -No violence and they have full freedom nobody to pressure them. -Fish resources are reduced because of modern gear and growing population.

Mapping Social Context of the Village

Taleak Tbong village is relatively poor due to the fact that farmers can only grow crop one season in a year. This is due to the limited water resource. The well-being of the villagers solely depends on their source of income which is agriculture. Majority of them are farmers or rice cultivators. Being "insiders" (farmers), they know how everyone differs from another person in the village. Villagers can identify who are well-off and who are in need. Based on the criteria set by the villagers Taleak Tbong has at least 4 to 5 groups, from poor group to better-off group.

Socio-economic Characteristics

Land ownership. Most of the people in the village have their own land. However due to lack of capital and unpaid debts, some farmers lost their land. If the poor group has land, usually the size is at least .12 hectare to less than a hectare. For the middle group their land size ranges from 0.5 to 2.5 hectares. For the rich group their land area is not that different from that of the middle group.

House. One distinct factor that can be observed even by outsiders is the quality of the house of rich and poor in the village. Most of the rich families have elevated houses and with cement or galvanized iron roofing. On the other hand, the houses of poor families are typically small, made of leaves and use clay as wallings.

Source of income. Generally the source of income in the village is from rice cultivation. Aside from cultivating rice some people have other options like those farmers without land or with limited land area. Most of the poor families work as helpers in other villages or for better-off people in the village. Some families also collect food and bamboo in the forest for selling. From the middle to better off group, other sources of income maybe non-farming activities like providing services in the village, operating rice mills, construction work, making wine and trading.

Livestock. The number of livestock also tells the level of well-being of families in the village. Most of the rich families have larger number of livestock that they rear, rent to other farmers and sell. The rich group have an average of 3 -6 heads of livestock while the poor group usually does not have any.

Transport. Having motorbikes in the village is also a symbol of status. Most of the better-off families have motorbikes while most of the poor families do not have any transport. For the middle group, some of them have either bicycle or motorbikes.

Other assets. Other assets refer to equipment and appliances in the household. Some better-off families have a pump and rice mills that they can rent to farmers as their additional source of income. Most of the houses of better off families also have appliances like radio which are mostly lacking in poor families' houses.

Table 3. Well-being Ranking of Villagers in Taleak Tbong Village

	Trial I	Trial II	Trial III
I	<p>Small house with leaf roof Appliance small radio Limited livestock (2) No transport Sell land for food Own land 0.12ha Enough food for 2months Collect wood and bamboo for selling Number of family is 5</p>	<p>Small house with leaf roof Have small radio No appliance No livestock Own land 0.10-12ha Enough food for 1month Use chemical fertilizer 5kg/year Work as helper Collect wood for selling Average number family 8</p>	<p>Small house with leaf roof No livestock Appliance like small radio No Transport Enough food for 2months Get a debt from group 4 Collect wood for selling Number of family 5</p>
II	<p>Small house with leaf or GI sheet Own land 0.18-0.23ha Enough food for 3months Collect wood and bamboo for selling Have bicycle Appliance like radio, cassette player Use chemical fertilizer 20-100kg/ha Number family 4 Limited livestock (2)</p>	<p>Small house with leaf roof No livestock Have bicycle Appliance like radio cassette play Own land 0.12-0.5ha Enough food for 7months Collect wood for selling Use chemical fertilizer 50kg/year Number of family 5</p>	<p>House with leaf or GI sheet Have livestock 50% Own land 50% Enough food for 6months Rice yield 700kg/ha Appliance like radio Collect wood for selling</p>
III	<p>House with leaf, GI sheet or tiles roofs Have mostly motorbike Operating a rice mill Water pump Appliance like radio, cassette player and TV Own land 0.25-2.5ha Enough food for 4months Selling at home Carpenter and construction worker 2-6livestock (cows) Use chemical fertilizer 2-5 sacks/year Number family 8</p>	<p>House with GI sheet or tiles roofs Have bicycle, motorbike Own land 0.5-1ha Appliance like TV, Radio Operating a water pump Enough food for 10months Use chemical fertilizer 50-100kg/year Average number 6</p>	<p>House with leaf roof Enough food for 7months Own average land? Collect wood and bamboo for selling Mostly bicycle and 20% motorbike Work as helper Appliance like TV Operate a rice mill 3-4 livestock (cow) Average 6 children</p>
IV		<p>House with tiles roof Have bicycle, motorbike 3-6 livestock (cows) Own land 0.5-1ha Enough food for 10months Use fertilizer 50-100kg/year Collect wood and bamboo for selling Number of family 7</p>	<p>House made from bride with tiles roof Own land 3 ha Enough food for whole year Provide rice as credit Appliance like TV, cassette player, speaker, karaoke Have bicycle, motorbike Operating a rice mill Have money for credit Making wine for selling Selling at home Average number of family is 6</p>
V		<p>All house with tiles roof Appliance like TV, cassette player Operating a rice mill Water pump, generator 4-6livestock(cows) Have motorbike Own land 1-2ha Enough food for the whole year and selling Making wine for selling Collect wood for selling Use chemical 3-5 sacks/year Number family average 8</p>	

Activity Profile of the Village

Most of the farmers in *TaleakTbong* village have a lot of activities. Although the water resource is limited, the most important activity in the village is still rice cultivation. The farmers can only grow rice once a year. The farmers identified a total of 14 important activities. Among these activities, only one is non-income generating which is taking care of children. The rest of the activities are income generating and related to agriculture. Aside from rice cultivation, livestock and cropping were the most important activities identified. All groups also identified fishing as important, however it was not ranked as high as the first three that were discussed earlier.

Table 4. Summary of Important Activities in the Village

Socio-econ group	Gender	
	Men	Women
Rich	Rice production (176)	Taking care of children (74)
	Cropping (79)	Rice production (68)
	Livestock (76)	Livestock (39)
	Collect wood (42)	Crop production (31)
	Fishing (28)	Wage labor (28)
	Wage labor (23)	Fishing (12)
	Carpentry (21)	Handicraft (10)
	Seller (11)	Make cake (6)
	Iron work (5)	
	Collect palm juice (3)	
Poor	Rice production (92)	Rice production (65)
	Cropping (55)	Livestock (43)
	Livestock (49)	Crop production (37)
	Collect wood (26)	Collect wood (24)
	Wage labor (26)	Weaving leaves (20)
	Fishing (25)	Fishing (20)
	Collect palm juice (9)	Wage labor (19)
		Seller (19)

The diversity of activities of the poor group is not similar with the rich group. The rich group has more activities than the poor group. This may be due to the fact that poor farmers could not engage in other activities due to limited resources and time. Most of the activities of the poor group depend on natural resource and are also related to income and food. The poor group did not even mention looking after their children as important. Making cake, carpentry, handicraft and iron works all need capital and skill which are lacking from the poor farmers.

Both men and women identified rice cultivation and livestock as the most important activities in the village. However there are some activities that are not true with both sexes. One example is the chore of looking after their children, which was not mentioned at all by both the rich and poor men groups. For the women group it comes third as most important, next to rice cultivation and livestock rearing. Both men and women have their own 'field' in terms of working as presented in **Table 4**. Some activities of the men that were not mentioned by women are collecting palm juice, carpentry and iron work. These are considered as traditionally male chores/work. On the other hand, making cake, weaving and handicraft making are women activities which were not mentioned by the men.

Seasonality

(Information in the calendar was based on last year's experience)

Weather.

Generally there are two seasons in the village: dry and rainy. The hot season is considered the longer season because the temperature continues to be generally high even if it has started raining already. The rainy season usually starts at the end of May and gets heavy during the months of September to November according to the rich group. During this period flooding occurs in the village. The end of this period is also the beginning of the cold season. However the poor men did not mention a cold season in their calendar. The hot season is at its peak in the village during the month of April.

Tradition.

The people observe a lot of festivals and social activities in the village as part of their tradition and culture. Some of these festivals or ceremonies are related to their religion. Some are also related to agricultural activities like praying for water in May, the ploughing ceremony to commence rice cultivation, the harvesting ceremony and the weeding ceremony which happens at the end of the year.

Economic activities

Seasonality calendars were created to illustrate the different economic activities of the different groups in the village. This activity gives a picture of the village's livelihood throughout the whole year. The groups produced their own distinct list of economic activities.

Almost all groups except the poor women identified the main economic activity related to agriculture is rice production. Majority of the main economic activities identified by all groups have something to do with food production. For the rich group, both men and women, the list of economic activities are related to agriculture and are performed in close proximity within their own area. On the other hand, the poor group have other activities outside their farm or even outside their village.

In terms of gender, there are no major differences also aside from collecting of palm juice from poor men group and garment factory from poor women group. Both

gender seems to be doing the same kind of livelihood activities in the village, although their priorities are different by group or even by individual depending upon their skills and resources.

Table 5. Summary of Important Economic Activities in the Village

Socio-econ group	Gender	
	Men	Women
Rich	Rice production Cropping Livestock Fishing Wage labor Selling (small)	Rice production Cropping Livestock Fishing Selling Wage labor
Poor	Rice production Cropping Livestock Fishing Collect wood Collect palm juice Wage labor Making wine Selling	Cropping Livestock Fishing Collect wood Thatching Selling Garment factory Wage labor

The economic activities are performed during different seasons depending on the group of farmers. In the seasonal calendar exercise, activities were identified as either yearly or seasonal ones. The men group identified five activities that are done the whole year. However not all of these are performed by the two groups of men. For the rich men they identified crop production, fishing, livestock production, and paid labor as year-round activities. Rice production and trading can also be considered almost year-round activities since they mentioned that it is only one month in a year that they do not do the above mentioned activities. However, the poor men only work as hired labor and traders which are done for the whole year. The rest of activities are seasonal. Even rice production, collection of wood, wine-making and collecting palm juices are seasonal activities for poor men. Fishing is almost a year-long activity. It is only during December when poor men do not collect aquatic animals.

The seasonality pattern of women-related economic activities is also different, with some activities not being done by both economic groups. Fishing, thatching and livestock production are considered year-round economic activities. Other activities like collection of wood, working as hired labor, working in a garment factory and trading are considered seasonal. These activities are done secondary only to the main economic activities, which are related to agriculture. Such agriculture-related activities such as rice production and cropping are considered by both poor and rich women groups as seasonal activities. However the rich women group do more activities and/or for a longer period, that are related to cropping and rice production. On the other hand, poor

women spend more time in off-farm activities like thatching, fishing and looking after their livestock.

Migration.

Most of the younger people in the village go to other places to work to earn additional income for their family. Poor men usually go to Phnom Penh to work in construction but would usually go back to the village during the rice cultivation season. Other groups also go to other places. The women usually work in garment factories and as helpers in the household of better off families. The young and middle age men would usually work in construction.

Health.

A major illness that occurred in the village is malaria. (which was mentioned only by the rich group) Other illnesses like flu, fever and colds are common among the villagers. However, some of the villagers tend to get malaria during the months of January to July.

Role of Aquatic Animals

Aquatic animals collected or harvested from the systems play a role in the livelihood of the villagers. Some of these roles are related to the criteria that farmer used in ranking the importance of aquatic animals. To identify the most important species in the village, farmer use at least seven (7) criteria. Most of the farmers benefit from aquatic animals which is why they included fishing as one of the most important activities in the village. Although fishing did not rank as high as other activities, the most tangible benefits that farmers get from aquatic animals are food and income generation.

Food. The top three criteria used by farmers in ranking the importance of aquatic animals all relate to food consumption. Consumption and taste both can be indicators for food. However abundance can be related to other benefits. Main reason why farmers go fishing is because it is part of their food collecting activity. Farmers would go to natural resource where they have access like forest, grassland, lakes, and swamps to collect food. Collected AA will go directly to the household to be eaten fresh. If in big or excess quantities, most of the farmers dry or process them. The surplus then gets sold.

Income. The high value criterion is directly related to income. It ranked 4th most important. Farmers collecting aquatic animals would also consider or prefer AA that demand a good price in the market like snakehead and catfish. The role of AA as it relates to income may be seasonal to some farmers particularly in this village, where water is limited during the rainy season.

Table 6. Summary of Important Criteria in Ranking the Importance of AA

Socio-econ group	Gender	
	Men	Women
	Consumption (65)	Taste (51)

Rich	Taste	(33)	Processing	(42)
	Value	(29)	Easy to catch	(37)
	Abundant	(23)	High value	(36)
	Easy to catch	(20)	Consumption	(29)
	Processing	(16)	Abundant	(13)
	Bones	(7)		
Poor	Abundant	(50)	Abundant	(41)
	Consumption	(30)	Taste	(38)
	Taste	(29)	Easy to catch	(34)
	Easy to catch	(28)	High value	(32)
	Value	(26)	Consumption	(30)
	Can be process	(20)	Can be process	(21)
	Bones	(14)		

Importance of aquatic animals may differ among the various groups in the village although in general all groups recognize its contribution to food and nutrition. Among the 7 criteria used by the farmers, only one relates to income and the rest are directly related to food and consumption. Consumption topped the ranking.

The poor group value the importance of aquatic animals in different ways as they look more on the abundance and availability of the species. Poor farmers prefer aquatic animals that can be collected year-round which give them sure income and available food. Value of the AA is less important with the poor group because very few of them sell their catch.

For women, the criteria are a bit different also because they give more importance to the taste of the species as well its ease of collection. Men prefer species of aquatic animals that can be eaten by the household and its abundance, regardless of tastiness.

Important Aquatic Animals

Although the village has limited water resource particularly during dry season, the aquatic animals are still diverse in variety, with 21 important species identified by the villagers. Most of the aquatic animals identified can be collected from the wild which is the only place poor farmers have access to. Like any other village in this province, snakehead was identified as the most important aquatic animal in the area. However, the top ranked aquatic animals are not dominated by fish but have some non-fish species like crab (3rd), shrimp, frog, eel, snail and snake.

Table 7. Summary of Important Aquatic Animals in the Village

Socio-econ group	Gender	
	Men	Women

Rich	Snakehead	(41)	Snakehead	(18)
	Climbing perch	(18)	Crab	(18)
	Catfish	(16)	Rasbora	(17)
	Small shrimp	(14)	Small shrimp	(17)
	Frog	(14)	Frog	(17)
	Freshwater eel	(13)	Climbing perch	(15)
	Spiny eel	(12)	Snail	(15)
	Mystus	(12)		
	Rasbora	(10)		
Poor	Climbing perch	(17)	Mystus	(20)
	Catfish	(17)	Spiny eel	(20)
	Frog	(17)	Climbing perch	(17)
	Snakehead	(16)	Catfish	(17)
	Spiny eel	(14)	Freshwater eel	(15)
	Freshwater eel	(14)	Crab	(14)
			Snake	(12)
			Frog	(12)
		Small shrimp	(11)	

Like in the criteria used in ranking the importance of aquatic animals, different groups have a different list of important aquatic animals as well. Rich men have the shortest list of aquatic animals and rich women also have the longest list (16 species), though not much difference with poor group (15 species).

For the poor group, snakehead did not come as the most important specie but climbing perch, catfish and spiny eel ranked high. The rich group did not mention species of snake but was considered as one of the important species by the poor group. There are some species also of AA that rich people identified but were not mentioned by the poor like snails and rasbora.

Women have a different list also from men in terms of important aquatic animals. The crab, which was considered by women as third most important was not mentioned by the men. The snail and snake were also not in the men's list but was identified by women, though it got a low rank.

Sources of Aquatic Animals

There are a lot of sources of aquatic animals in the village. Some of the aquatic resources are seasonal and some are all through the year. Some of the aquatic systems that have water all year is lake and small lakes. These resources are open access with all the villagers. Other sources of aquatic animals are canal, forest, and rice fields. Rice fields have abundant aquatic animals during rainy season. Trap pond also one of the most common source of aquatic animals in the village. When the water in the lake and river become shallow, villagers would trap aquatic animals in the trap pond. Draining of trap pond is done during summer. For the ditches and pond, villagers use these systems to trap and stock aquatic animals collected from rice fields and nearby water bodies.

Gear Used

There are several fishing gears used by the different groups. There are fishing gears that are used by all groups and some by just a few. There are some gears that can only be used for certain species and sometimes in a particular season. The location of the fishing area can also determine what fishing gear to use. Below are some of the fishing gears common in the village:

Cast net	Use by all groups
Hook line	Use by poor groups
Hook long line	Use by poor groups
Oblong trap	Use by all groups
Drum trap	Use by all groups
Screen net	Use by all groups
Lighting	Use by poor and rich men; rich women
Chhib	Use by poor and rich men; rich women
Catch by hand	Use by poor groups and rich women
Gill net	Use by rich group and poor women
Handled pick out	Use by rich group and poor women
Scooping net	Use by poor women
Jump trap	Use by rich group
Spear	Use by rich group
Dig	Use by rich and poor women
Dry up	Use by rich group and poor women
Drag net	Use by rich women

Seasonality of Aquatic Animals

The abundance of aquatic animals in the village also depends on the season. Some of the aquatic resources are limited in particular seasons of the year. Rice fields are usually dry during dry season and so aquatic animals are limited or are not available. Most of the important aquatic animals for poor men are moderate in supply in more than half of the year and this is during the rainy or wet season. According to the poor group, aquatic animals are abundant in the village during October and November. Most of the aquatic animals are collected from canals, rice fields, ditches and household ponds. Some of the important aquatic animals for poor men are scarce for three to four months (December to April). For the rich men, most of the important aquatic animals are abundant for at most three months (September to November). This period is the peak of the rainy season. Aquatic animals tend to decrease in population when the cold weather starts and the water begins to recedes.

Among the different important aquatic animals, catfish and snakehead have the same situation during the year.

Trends of Aquatic animals

Aquatic resources in the village during the early years (1950's) were rich and unexploited. During this period there were few households in the village and very few collecting aquatic animals. Farmers who collected aquatic animals used simple and not destructive fishing gear because the demand for aquatic animals for food source was not so high. During the political insurgency in the country, most of the villagers were afraid to go out and collect aquatic animals. Thus, most of the water resources were not being used for collection of aquatic animals.

The situation of the aquatic animals and water resources in the village started to deteriorate when the population in the village began to increase. Demand for aquatic animals increased thereby making the fishermen collect more and to use modern or "more effective" fishing gears. Some of the fishermen introduced destructive fishing gears like electro fishing to be able to collect more aquatic animals. In the year 1993 when rice cultivation was more intensified, most of the farmers used chemical fertilizers and pesticides that had a negative impact to the water resources in the community particularly in the rice fields, lake and canals. During this period the population of aquatic animals declined drastically and the occurrence of diseases was also observed. At present the situation of the aquatic animals is still decreasing because no one seems to be managing the common water resources in the village to increase the population of aquatic animals.

Farmers' Meeting

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

Annexes

Seasonal Calendar

Weather

Poor men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Hot	Hot, a little rain	Hot, rain	Hot, rain	Hot, rain	Hot, rain	Hot, a little rain	Hot, a little rain	Hot, a little rain	Hot	Hot	Hot

Poor women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Hot	Hot	Rain, wind	Rain	Rain	Rain	Rain, wind	Rain, wind, cold	Rain, wind, cold	Rain	Cold	Hot

Rich men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Hot	Rainy	Dry	Rain, wind	Rain, wind	Floods, typhoon winds, rain	Floods, typhoon winds, rain	Rain, typhoon wind, floods	Medium hot, little rain	Cold, windy	Colder, windy	hot

Rich women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
	Rain, wind	Rain, wind	Rain, wind	Rain, wind	Rain, wind	Wind, cold	Wind, cold	Cold, unseasonal rain	Cold, unseasonal rain	Hot	Hot

Social events

Poor men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Khmer New Year	Visakha Bochea	Prying Ceremony	Celebration of rainy season	End of rainy season	Pchum Ben ceremony	Celebration of rainy season	Full moon Water festival-Kathin ceremony			Meakh Bochea	

Poor women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Khmer New Year	Ceremony in village – Praying for water	Ceremony in village – Praying for water	Celebration of rainy season	End of rainy season	Pchum Ben ceremony	Celebration of rainy season	Full moon-water festival-Kathin ceremony	Meakh Bochea	Meakh Bochea	Meakh Bochea	

Rich men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Khmer New Year	Visakha Bochea	Visakha Bochea	Celebration of rainy season	End of rainy season	Pchum Ben ceremony	Celebration of rainy season	Full moon Water festival-Kathin ceremony	Wedding ceremony	Wedding ceremony	Wedding ceremony	Wedding ceremony

Rich women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Khmer New Year	Visakha Bochea	Visakha Bochea	Celebration of rainy season	End of rainy season	Pchum Ben ceremony	Celebration of rainy season	Full moon Water festival-Kathin ceremony	Praying for water	Praying for water	Praying for water	

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Economic Activities

Poor men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Rice production, crop production, find wood, make wine-small seller, worker, palm juice fishing fish, livestock	Crop production, find wood, make wine-small seller, palm juice, fishing, plowing, worker, livestock	Crop production, find wood, make wine-small seller, fishing fish, labor, plowing, livestock	Make wine, small seller-fishing, labor, livestock, plowing	Sowing rice, fishing labor, livestock, small seller	Fishing fish, labor, small seller, livestock, transplanting,	Make wine-small seller, fishing fish, labor, raising livestock	Crop production, make wine-small seller, palm juice, fishing fish, labor, raising livestock	Crop production, harvesting rice, palm juice, labor, livestock, small seller, fishing	Crop production, harvesting rice, palm juice, fishing, livestock, labor, small seller	Crop production, find wood, palm juice, fishing, livestock, labor, small seller	Crop production, find wood, palm juice, fishing, livestock, labor, small seller

Poor women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Find wood, worker, fishing, thatching, livestock	Plowing, livestock, collect wood, thatching, fishing	Plowing, crop production, livestock, thatching, fishing	Crop production, raising livestock, put fertilizer, thatching, fishing	Transplanting, rice sowing, livestock, worker, thatching, fishing	Transplanting, livestock, thatching, fishing, worker	Livestock, work in garment factory, thatching, fishing	Harvesting crop production, livestock, thatching, fishing	Harvesting rice, crop production, thatching, fishing, livestock	As for December plus: sell produce	Livestock, sell produce, thatching, fishing	Find wood, thatching, fishing

Rich men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Crop production, fishing, labour, small seller, livestock,	Crop production, prepare materials for rice production, fishing, small seller, livestock, worker	Sowing rice, transplanting, crop production, livestock, labour, fishing	As for June plus: small seller	As for July	As for July	Harvesting, crop production, livestock, labourer, fishing, small seller	Harvesting, crop production, livestock, worker, fishing, small seller,	Harvesting, worker, fishing, livestock, small seller, crop production	As for December	As for December	As for December

Rich women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Livestock, small seller	Plowing, livestock, crop production, small seller,	Sowing rice, plowing, transplanting, livestock, crop production	Transplanting, livestock, crop production, worker	Transplanting, livestock, worker,	Transplanting, weeding, livestock, crop production, worker	Fertilizing, transplanting, livestock, crop production, fishing	Fertilizing, harvesting, crop production, fishing, livestock	Harvesting, crop production, fishing, worker, livestock	Harvesting, livestock, crop production, worker	Harvest, livestock, crop production, worker	Livestock, crop production, worker, small seller

Income/busy

Poor men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Collect wood, bamboo	Collect wood, bamboo	Collect, bamboo		Busy	Busy	Busy	Busy	Busy	Busy	Income from rice crops	Income from rice crops

Poor women

		Busy	Busy	Busy	Busy				Income from, rice crops	Income from, rice crops	
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Rich men

Income	Income	Income	Busy	Busy	Busy	Income, busy	Income, busy	Income, busy	Income, busy	Income, busy	Income from rice and crops
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Rich women

Income from livestock, crops and wood	Income from livestock, crops and wood, busy	Busy	Busy, income from livestock	Busy, income from livestock	Busy, income from livestock	Busy	Busy	Busy	Busy	Income from livestock	Income from livestock
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Health

Poor men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Fever Dysentery	Normal	Normal	Normal	Normal	Normal	Normal	Flu, fever	Normal	Normal	Happy	Happy

Poor women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Fever Dysentery, malaria	Fever, Flu, typhoid	Fever Flu, typhoid	Fever Flu, typhoid	Normal	Unhappy	Happy	Happy, flu, fever	Normal, flu, fever	Happy	Happy	Happy

Rich men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Malaria Fever, flue, Dysentery	Malaria Fever, flue, Dysentery	Malaria Fever, flue, Dysentery	Malaria	Malaria	Normal	Normal	Fever, flu	Fever, flu	Fever, flu	Fever, malaria	Fever, malaria

Rich women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Flu, malaria, typhoid, dengue	Flu, malaria, typhoid, dengue, dysentery	Flu, malaria, typhoid, dengue, dysentery	Flu, malaria, typhoid, dengue, dysentery	Normal	Normal	Unhappy	Unhappy	Normal	Happy	Happy	Happy, fever

Migration

Poor men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Go to PP to work in garment factory	Go to PP to work in garment factory	Back from PP - go to PP to work in garment factory	Back from PP	Back from PP						Go to PP to work in garment factory	Go to PP to work in garment factory

Poor women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Go to PP, back from PP						Go to PP to work in garment factory, worker					

Rich men

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Go to earn money in PP											Go to earn money in Battambang and PP

Rich women

April	May	June	July	August	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Go to PP to work in garment factory	Go to PP to work in Garment factory			back from PP	Back from PP	Back from PP	Back from PP				Go to PP to work in garment factory

Activity Scoring**Rich men group**

Activities	Farmer																							
	Seang Nang	Oun Sim	Sot Sim	Nob Vooun	Gnait Ta	Nhaim Bol	Em Pouk	Sim Horn	Tim Mon	Chav Chin	In Oeun	Nhaim Noy	Yan g Touch	Hnaim Chhil	Sdeung Gnov	Em Him	Horm Hoeun	Sok Sorn	Khom Touch	Khom Khon	Chhan Lonh	Vin Chry	Seang Tat	Neang Dy
Rice production	6	6	4	4	5	3	7	9	10	8	8	8	9	8	14	12	10	11	7	6	4	9	6	2
Crop production	3	3	3	3	4	0	1	3	2	4	5	3	3	2	6	8	2	9	4	4	4	4	3	6
Livestock	3	5	3	3	4	4	3	4	8	5	0	3	5	5	0	0	2	0	4	2	4	2	4	3
Worker	0	2	0	3	0	4	5	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	2	3
Fishing	1	1	5	3	1	2	0	0	0	0	7	0	0	1	0	0	0	0	2	0	2	1	1	1
Seller	1	0	4	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Palm juice	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Find wood	2	2	0	2	2	0	4	2	0	3	0	2	3	6	0	0	3	0	1	5	2	1	2	0
Iron worker	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
House maker	4	0	0	1	0	3	0	0	0	0	0	1	0	0	0	0	3		1	3	0	2	1	2

Poor men

Activities	Farmer													
	Khan Khoeun	Touch Torn	Sim Korm	Svay Hao	Khit Mao	Khim Dorn	Ouk Tib	Vong It	Bun Kun	Puth Treung	Im Neu	Hun Hoy	Leang Ly	Sem Van
Rice production	6	5	5	5	5	5	8	8	9	6	10	7	5	8
Crop production	5	4	4	4	3	4	4	3	6	5	5	2	3	3
Livestock	4	3	4	3	3	3	4	2	5	4	5	2	3	4
Find wood	3	2	4	2	3	0	2	3	0	5	0	2	0	0
Worker	2	2	0	2	3	3	1	2	0	0	0	2	4	5
Palm juice	0	2	0	2	2	0	0	0	0	0	0	3	0	0
Fishing	0	2	3	2	3	5	1	2	0	0	0	2	5	0

Poor women

Activities	Chhai Khon	Yaim Phain	Neang Saroeun	Than Seav	Sim Ten	Lim Chon	Lim Phy	Ouk Raim	Seang Yoeun	Keo Kea	Khom Chanthy	Seang yim
Rice production	4	4	5	5	7	6	5	8	6	6	4	5
Livestock	2	2	3	4	4	3	4	3	3	6	4	5
Crop production	3	3	3	3	3	3	2	4	3	2	3	5
Find wood	2	2	3	2	1	1	1	2	3	1	3	3
Sewing leafs	2	2	2	1	1	1	2	2	2	1	2	2
Fishing	3	3	2	3	2	1	2	1	1	1	1	0
Worker	2	2	2	2	1	1	2	1	1	3	2	0
Seller	2	2	2	2	1	4	2	1	1	2	1	0

Rich women

Activities	Seang Yim	Kheav Ork	Sem Khim	Rim Soeun	Nou Nov	San Noy	Soeun Chom	Po Raim	Neang Sarang	Seang Saphoeun	Khan Sorn	Nhaim Yin	Nek Thav	Ven Te	Sean g Rin
Rice production	7	7	6	5	5	5	4	6	6	6	0	6	0	5	0
Livestock	0	3	3	3	0	2	4	5	4	4	4	4	0	3	0
Crop production	5	2	2	2	4	3	2	3	2	2	2	0	0	2	0
Worker	0	2	2	3	3	2	2	2	2	2	2	2	0	2	2
Make cake	0	0	0	0	1	1	1	0	0	3	0	0	0	0	0
Handicraft	0	0	0	3	3	2	0	0	0	0	0	1	1	0	0
Fishing	0	0	0	0	0	2	2	0	1	2	2	1	1	0	1
Child care	8	6	5	4	4	3	5	4	5	3	4	6	3	8	6

Aquatic Animal Identification and Scoring

Poor men

Species	Criteria						
	Abundant	Easy to catch	Value	Processing	Taste	Bones	Consumption
Snakehead -in rice field, lake, small lake, canal -used Cast net, hook line, hook long line	4	2	3	2	3	0	2
Climbing perch in rice field, lake, small lake, canal, ditch -used Cast net, hook line, hook long line	4	2	2	2	3	2	2
Catfish in rice field, lake, small lake, canal, ditch -used Cast net, hook line, hook long line	4	1	3	2	3	0	2
Three-spot gourami in rice field, lake, small lake, canal, ditch -used Cast net, hook line, hook long line	3	2	1	2	1	2	2
Rasbora in rice field, lake, small lake, canal, ditch -used Cast net, oblong trap, drum trap	2	2	1	2	1	1	2
Spiny eel in rice field, lake, small lake, canal, ditch -used Cast net, Cast net, oblong trap, drum trap	4	1	2	2	2	1	2
Small shrimp Cast net, Cast net, oblong trap, drum trap, screen net	4	3	1	1	2	0	2
Frog in rice field, lake, small lake, canal, ditch, trap pond -used dig, hook line, lighting	5	2	3	1	3	1	2
Toad in rice field, lake, small lake, canal, ditch, trap pond -used dig, hook line, lighting	4	3	1	0	1	0	2
Mystus in rice field, lake, small lake, canal, ditch -used Cast net, hook line, hook long line	2	1	1	2	1	1	2
Crab in rice field, lake, small lake, canal, ditch, trap pond -used hook line, oblong trap, drum trap, catch by hand	3	1	1	1	1	2	2
Snail in rice field, lake, small lake, canal, ditch, trap pond -used hook line, oblong trap, drum trap, catch by hand	3	3	1	0	1	1	2
Snake in rice field, lake, small lake, canal, ditch, trap pond, forest -used hook line, cast net, hook long line, chhib(khmer)	3	2	1	1	2	2	2
Freshwater eel in rice field, lake, small lake, canal, ditch, trap pond, forest -used hook line, cast net, hook long line, chhib(khmer)	3	1	3	1	3	1	2
Whisker seatfish in rice field, lake, small lake, canal, ditch -used Cast net, hook line, hook long line	2	2	2	1	2	0	2

Poor women

Species	Criteria					
	Taste	Value	Easy to catch	Processing	Consumption	Abundant
Climbing perch -in rice field, trap pond, lake, small lake, -used net, cast net, gill net	3	3	3	2	3	3
Mystus -in rice field, trap pond, lake, small lake, -used net, cast net, gill net, hook long line	4	5	3	2	3	3
Catfish -in rice field, trap pond, lake, small lake, -used net, cast net, gill net, hook long line, handled pick out	3	3	4	2	2	3
Spiny eel -in rice field, trap pond, lake, small lake, -used net, cast net, dry up	5	4	3	2	2	4
Small shrimp -in rice field, trap pond, lake, small lake, -used oblong trap, drum trap, screen	2	1	1	2	2	3
Freshwater eel -in rice field, trap pond, lake, small lake, -used net, cast net, dry up, bamboo, oblong trap, drum trap	2	2	3	2	2	4
Three sport gourami -in rice field, trap pond, lake, small lake, -used oblong trap, drum trap, screen net	2	1	1	1	1	2
Whisker seatfis -in rice field, trap pond, lake, small lake, -used oblong trap, drum trap, screen net	3	1	2	1	1	1
Rasbora -in rice field, trap pond, lake, small lake, -used oblong trap, drum trap, screen	2	1	3	1	1	3
Yellow mystus -in rice field, trap pond, lake, small lake, -used net, cast net, gill net, hook long line, handled pick out	2	3	1	1	1	1
Snail -in rice field, trap pond, lake, small lake -used catch by hand, oblong trap, scooping, net	2	2	2	1	1	3
Snake -in rice field, trap pond, lake, small lake, forest -used hook line, dig	2	3	1	1	2	3
Grey feather back -in rice field, trap pond, lake, small lake -used gill net, net, oblong trap, drum trap	2	1	1	1	2	1
Frog -in rice field, trap pond, lake, small lake -used hook line, dig	2	1	3	1	2	3
Crab -in rice field, trap pond, lake, small lake -used catch by hand, oblong trap, hook.	2	1	3	1	3	4

Rich men

Species	Value	Taste	Processing	Abundance	Easy to catch	Consumption	Bones
Snakehead -in rice field, lake, small lake, trap pond, canal, ditch -used handled pick out, net, drum trap, oblong trap, jump trap.	5	7	2	1	1	30	
Catfish -in rice field, lake, small lake, trap pond, canal, ditch -used handled pick out, net, drum trap, oblong trap, jump trap.	5	5	1	1	1	3	0
Climbing perch -in rice field, lake, small lake, trap pond, canal, ditch -used handled pick out, net, drum trap, oblong trap, jump trap.	2	4	2	2	2	3	3
Rasbora -in rice field, lake, small lake, trap pond, canal, ditch -used net, drum trap, oblong trap, gill net	1	1	2	1	1	3	1
Spiny eel -in rice field, lake, small lake, trap pond, canal, ditch -used dry up, cast net, oblong trap, hook.	3	3	1	1	1	3	0
Mystus -in rice field, lake, small lake, trap pond, canal, ditch -used dry up, cast net, oblong trap, drum trap	2	2	1	2	1	3	1
Three-spot gourami -in rice field, lake, small lake, trap pond, canal, ditch -used dry up, cast net, oblong trap, drum trap	1	1	2	1	1	3	1
Small shrimp -in rice field, lake, small lake, trap pond, canal, ditch -used screen, dry up, oblong trap, chhib(khmer)	1	1	2	4	3	3	0
Whisker seatfish -in rice field, lake, small lake, trap pond, canal, ditch -used dry up, cast net, oblong trap, drum trap	2	2	1	1	1	3	0
Freshwater eel -in rice field, lake, small lake, trap pond, canal -used bamboo, lighting, slashing, three point spear.	3	2	1	2	2	3	0
Frog -in rice field, lake, small lake, trap pond, canal, ditch -used dig, hook line, lighting, drum trap	3	3	1	2	2	3	0
Snail -in rice field, lake, small lake, trap pond, canal, ditch -used catch by hand	1	1	0	1	2	3	0
Crab -in rice field, lake, small lake, trap pond, canal, ditch -used oblong trap, dig	1	1	0	2	2	2	1

Rich women

Species	Taste	Value	Easy to catch	Processing	Consumption	Abundant
Snakehead -in rice field, lake, small lake -used handled pick out, jump trap, net, gill net, oblong trap, drum trap.	5	5	1	4	1	2
Catfish -in rice field, lake, small lake -used handled pick out, jump trap, net, gill net, oblong trap, drum trap.	5	3	1	3	1	0
Climbing perch -in rice field, lake, small lake -used net, oblong trap, drum trap, drag net,	5	2	4	2	2	0
Rasbora -in rice field, lake, small lake -used screen net, net, gill net, oblong trap, drum trap.	3	1	4	4	3	2
Small shrimp -in rice field, lake, small lake -used screen net, net, gill net, oblong trap, drum trap.	2	1	5	3	4	2
Spiny eel -in rice field, lake, small lake, canal, ditch -used cast net, oblong trap, drum trap.	3	2	1	3	1	0
Swamp barb in rice field, lake, small lake -used screen net, net, gill net, oblong trap, drum trap.	2	1	1	1	1	1
Pygmy gourami in rice field, lake, small lake -used screen net, net, gill net, oblong trap, drum trap.	2	1	1	2	2	1
frog -in rice field, canal, pond, lake -used hooked line, single hook line, drum trap, lighting	5	4	4	2	2	0
Three spot gourami -in pond, ditch, lake, small lake -used oblong trap, drum trap, chhib	1	1	2	2	1	3
Catopra -in trap pond, ditch, canal, stream -used net, cast net, dry up	3	3	1	2	0	0
Freshwater eel -in lake, stream, embankment -used jump trap, point spear	5	4	2	2	1	0
Whisker sheatfish -in stream, lake, -used net, cast net, dry up, single line	3	3	1	2	0	0
Wrestling half-beak -in lake -used chhib,	3	3	1	2	0	0
Crab -in rice field, lake, small lake, ditch, canal -used chhib, oblong trap, dig,	1	1	5	4	5	2
Snail -in rice field, lake, small lake, embankment -used catch by hand, scooping, oblong trap	3	1	3	3	5	0

Seasonality of Aquatic Animals

Poor men

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Climbing perch	Medium	Medium	Medium	Medium RF, ditch, gill net, hook long line, line	As July	As July	Abundant RF, canal, Scoop net, trap net, cast net	As October	Scarce Dry ditch, scoop net, trap net, lake	As December, plus: RF	As January	As January
Frog	Scarce Ditch, lake, hook, line	Moderate Lighting, lake, RF	As May	As May	As May	As May	Abundant RF, canal, hook, line	As October	Moderate, use drum trap, line, RF	As for December	As December	RF, ditch, hook, line, drum trap
Snakehead	Deficit RF, ditch, gill net, hook long line, line	Medium RF ditch, trap ponds	As May plus: trap net and gill net	As May, plus: in canal, hook long line	Abundant RF, ditch, gill net, line,	As August	As August	Moderate, trap ponds, lake, jump trap	Moderate, Ditch, trap pond, lake, jump trap, gill net and trap net	As December, plus: cast net, hook long line	Scarce Trap pond, ditch, dry trap pond, gill net,	As February, plus: cast net
Catfish	Deficit Trap pond, ditch, gill net, trap net, line, hooked long line	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above	As for Snakehead above
Spiny eel	Medium RF, trap pond, ditch, trap net, line, cast net, dry canal	As for May	As May	As May	A little more abundant, trap pond, canal, gill net, line, hook long line	As September	Abundant, oblong trap, drum trap, gill net, RF	Abundant As for November , plus cast net in the lake and ditch	Scarce RF, lake, ditch, hook, in canal	As December	As December	As December
Freshwater eel	Deficit Trap pond, ditch, drum trap, oblong trap, bamboo eel trap	As April	Moderate, RF, ditch, canal, drum trap, eel trap, oblong trap	As June	As June	As June	As June	Abundant RF, ditch, trap pond, drum trap, eel trap, oblong trap, lighting	As November	As November	As November	Scarce, Ditch, trap pond, RF, drum trap, eel trap, oblong trap

Rich men

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Deficit, in community pond, hook long line,	As April	As April	As April	As April	Abundant RF, ditch, use line and gill net	As September	As September	Medium Household pond, cast net, line, scoop net, dry pond	As December	As December	As December
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
Climbing perch	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above	As above
Frog	Deficit RF, lighting	Medium Lighting, RF	As May	As May		Abundant RF, lighting, drum trap, line	As September	As September	Medium RF, drum trap,	Deficit RF, ditch, hook, dig	As January	As January
Small shrimp	Deficit	Deficit				Abundant RF, scoop net, oblong trap	As September	As September	Deficit, scoop net, bamboo net, dry trap pond, in ditch and household pond	As December	As December	As December
Rasbora	Deficit	Deficit				Abundant -in rice field, scoop net, oblong trap	As September	As September	Deficit, scoop net, bamboo net, dry trap pond, in ditch, household pond	As December	As December	As December

Rich women

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Deficit (2-5kg), dry trap ponds and ditches	Don't catch any fish	As for May	As for May	Deficit (0-0.5kg), cast net, gill net, lighting, oblong trap, hook long line, RF, ditch, community pond	As September	As September	Abundant, hook long line, gill net, cast net, jump trap, in RF, ditch, trap pond, household pond	As November	As November	As November	As November
Crab	No crabs	As April	As April	As April	As April	As April	Abundant, RF, hole, hook, oblong trap, scoop net,	As October	As October	As October	Deficit Hook, in RF	As February
Frog	No frogs (don't catch frogs?)	As April	As April	As April	As April	Deficit, lighting, line, drum trap, hook long line, in RF, ditch, canal	As September	As September	No frogs (can't catch them because the ducks ate all the baby frogs)	As December	As December	As December
Three-spot gourami	There's an arrow on the original paper, no explanation	As April	Nothing	Nothing	Nothing	Nothing	Nothing	Deficit/mode rate? (0.1-0.5kg), scoop net, oblong trap, ditch, canal	As November	Deficit, scoop net	As January	As January
Small shrimp	There's an arrow on the original paper, no explanation	As April	Nothing	Nothing	Nothing	Nothing	Nothing	Deficit/mode rate? (0.1-0.5kg), scoop net, oblong trap, ditch, canal	As November	Deficit, scoop net	As January	As January
Snail	Nothing	Nothing	Nothing	Nothing	Abundant, scoop net, catch by hand, in RF, ditch	As August	As August	As August	As August	Nothing	Nothing	Nothing

Sometimes no data entry means no animal caught

Poor women (woven fish trap is made from cane , NOT bamboo)

Species	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Snakehead	Medium Ditch, trap pond, canal, cast net, dry pond, oblong, gill net, trap net jump trap, lighting, net, hook long line	Deficit As April	Deficit As April	Deficit As April	Medium As April, plus RF	As August,	As Septemb er	Abundant As September , plus cast net	As November	Medium As December,	As January	As January
Catfish	Medium Ditch, canal, trap pond, gill net, hook long line, line, cast net, woven fish trap	Scarce, ditch, canal, trap pond, dry ponds, gill net, cast net, line, trap net, hook long line	As May	As May	Medium Canal, trap pond, cast net, dry ponds, line, hook long line, woven fish trap, lighting, jump trap	As August	As August	Abundant, in ditch, canal, trap pond, cast net, dry, line, hook long line, woven fish trap	As November	Moderate, in ditch, canal, trap pond, cast net, dry, line, hook long line, woven fish trap	As January	As January
Climbing perch	Medium Ditch, canal, gill nets, oblong trap, trap net, scoop net, jump trap, line	Scarce As for April,	As for May	As for May	As for May	Abundant RF, ditch, canal, trap pond, gill net, oblong trap, scoop net, jump trap, line	Abunda nt As for Septemb er	As for September	As for September	Medium In ditch, canal, trap pond, cast net, dry ponds, line, hook long line, woven fish trap	As for January	As for January
Mystus	Medium Ditch, canal, trap pond, cast net, trap net, scoop net, jump trap	Deficit As for April	Deficit As for April	Deficit As for April	Deficit, As April	Abundant RF, ditch, canal, trap pond, scoop net, trap net, line, cast net, bamboo net	As Septemb er	As September	Medium ditch, canal, trap pond, trap net, scoop net, line, cast net,	As December	As Decem ber	As December
Small shrimp	Medium Trap pond, ditch, canal, scoop net, oblong trap, bamboo net	As April	As April	As April	As April	Abundant, RF, ditch, canal, trap ponds, scoop net, oblong trap, dry trap ponds, bamboo net	As Septemb er	As September	As September	As September	Mediu m as Septem ber	As for February
Crab	Deficit RF, ditch, canal, trap pond, oblong trap, trap net, dig, hook, catch by hand, bamboo net	As April	As April	As April	As April	As April	Abunda nt As April	As October	As October	As October	Scarce As January	Scarce As January

Trends of Aquatic Animals

Poor woman

Species	1955-60	1965-70	1979-80	1993-01
Snakehead	Abundant Low human population, deep lake, plenty of water plants, plenty of food for fish to eat, hard trap, oblong trap, bamboo net, ditch, rice field, trap pond	As previous	Medium Traditional gear, a few fishermen, little rain, water is shallow, scoop net, trap net, cast net, hard trap, bamboo net, oblong trap, gill net, line, lighting, jump trap	Deficit As previous, plus electro fishing, there are pesticides, fish disease
Catfish	As above, plus: hook long line,	As above plus: hook long line	Deficit, fish disease, high human population, pesticides, electro fishing, shallow water, scoop net, gill net, cast net, trap net, line, hook long line, in RF, ditch and canal	As previous
Climbing perch	As above, plus line, drum and jump traps	As previous	Moderate, fish disease, more fishermen, electro fishing	Deficit, as above, plus: as previous, even more fishermen
Mystus	Abundant, As above plus dry trap pond and ditch	As previous	Medium Water shallow, fish disease, electro fishing, chemicals, cast net, scoop net, dry	As previous
Small shrimp	A above, plus scoop net,	As previous	Medium Shallow water, higher population, electro fishing, in ditch, canal and rice field	Deficit As previous, as above
Crab	Abundant As above, plus: digging,	As previous	Moderate, as above, as previous	Moderate, high human population, chemicals, electro fishing, in ditch, canal, use, hook, dig, scoop net, gill net

Poor men

Species	1954-60	1965-70	1979-80	1993-01
Climbing perch	Abundant RF, ditch, lake was spawning ground for fish, and was very deep, oblong trap, drum trap, gill net, traditional gear	As for previous, but no fishermen	Abundant, traditional gear, In lake, canal. Lake and canal were deep, low population	Fewer fish, declining year after year, modern gear, higher population, lake shallow, no space for fish spawning
Frog	Abundant RF, trap pond, lake, hook line, dig, a few fishermen, use flood plain for fish spawning, lake was very deep	Abundant No fishermen due to civil war, plenty of fish in trap pond and ditch	As above	Fewer fish, high population, used modern gear, people cut flood plain, no space for fish spawning
Snakehead	As above	As above	As above	As above
Catfish	As above	As above	As above	As above
Spiny eel	As above	As above	As above	As above
Freshwater eel	As above	As above	As above	As above

Rich women

	1950-59	1960-70	1970-79	1979-1989	1990-01
Snakehead	Abundant, in ditch, low human population, no dividing walls, in the water body, use hard trap, dry trap ponds and ditches, catch by hand	Less abundant, ditches become dry, drought, low population, no dividing walls, catch by hand, hard trap, dry trap pond	Abundant, many dividing walls,	Moderate, fish disease, drought, many dividing walls	Deficit, not enough water, flood, use electro fishing, drought,
Crab	Abundant, low population, no fishermen, no ducks, no dividing walls, more flood plain,	As previous.	As previous	Moderate, more fishermen, no ducks	Deficit, drought, duck eats crabs, more fishermen
Frog	Very abundant, no ducks, nobody keeps ducks, no drought, few fishermen, lighting, hook long line	Less abundant, high population, few fishermen, use lighting, hook long line	As above	Moderate, high population, more children go to catch frogs, people keep ducks, water shallow, (it's drying up)	Deficit, drought, electro fishing, duck eats baby frogs, no water plants, more population
Three-spot gourami	Abundant, easy to find, no ducks, people don't like eating this fish. So don't catch it often, use trap net, gill net, scoop net, plenty of flood plain, no dividing walls	As previous	As above	As above	As above
Small shrimp	As above, no need to trade them, if one person catches more than they need, they offer it to somebody else	As previous	As above	As above	Deficit, drought, all ponds dry up,
Snail	Very abundant, but nobody likes eating them,	As previous	As above	Deficit, drought, ducks eat them, children go to collect them, (duck problem)	Deficit, as for previous, and population higher

Rich men

Species	1954	1965-70	1970-1979	1979-01
Snakehead	Abundant -In rice field, household pond, ditch, use hard trap, line, spear, fish exciter	Less abundant, people reclaim land for other uses, birds eat fish, little rain, cast net and trap net	Even less abundant, people dry ditch, to make mud for houses, fish go the canals to escape, fish disease in household ponds	Deficit, community pond, household pond, ditch, rice field, more fishermen, scoop net, cast net, trap net, gill net, electro fishing, dry ponds, use water for agriculture
Catfish	Abundant -In rice field, household pond, ditch, use hard trap, line, spear, korn	Less abundant, people reclaim land for other uses, birds eat fish, little rain, cast net and trap net	Even less abundant, people dry ditch, to make mud for houses, fish go the canals to escape, fish disease in household ponds	Moderate, community pond, household pond, ditch, rice field, more fishermen, scoop net, cast net, trap net, gill net, electro fishing, dry ponds, use water for agriculture
Climbing perch	Abundant -In rice field, household pond, ditch, use hard trap, line, spear, korn	Less abundant, people reclaim land for other uses, birds eat fish, little rain, cast net and trap net	Even less abundant, people dry ditch, to make mud for houses, fish go the canals to escape, fish disease in household ponds	Moderate, community pond, household pond, ditch, rice field, more fishermen, scoop net, cast net, trap net, gill net, electro fishing, dry ponds, use water for agriculture
Frog	Abundant -In rice field, ditch, lighting, drum trap,	Less abundant but as previous	More abundant than previous, no fishermen, in rice field, in ditch, water is deep, in hole,	Frog population decreasing each year, until deficit in 2001 High population, in ditch, rice field, in canal, hook, dig, line, drum trap
Small shrimp	Abundant -In rice field, ditch, Scoop net, oblong trap,	As previous	Medium -In rice field, ditch, -Used scoop net, oblong trap, only a few fishermen	Deficit More fishermen, collect shrimp for duck feed, -in rice field, ditch, canal, scoop net, oblong trap,
Rasbora	As above	As previous	As above	Deficit -more fishermen, used modern gear, drum trap, oblong trap, electro fishing, scoop net, in rice field, ditch, and canal