Aquatic Resources Valuation and Policies for Poverty Elimination in the Lower Mekong Basin

Profile for Aquatic Resources Management:

Tboung Kla, Koh Chruem and Ou Chralang Villages

Ou Mreah Commune, Siem Bouk District, Stung Treng Province, Cambodia

Danilo C. Israel, Mahfuzuddin Ahmed, Nao Thuok and Chu Kim

DFID Department for International Development

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Drawing a Village Profile for

The stage is set for the formal implementation of community-based management in the aquatic-resources dependent villages of the country with the passing of the Sub-Decree on Community Fisheries in Cambodia. Together with this welcome development, useful data and information have become even more important to support stakeholder-based planning and overall aquatic resources management at the village level.

The preparation of this village profile is one of the activities of the Aquatic Resources Valuation and Policies for Poverty Elimination in the Lower Mekong Basin Project, known as the Mekong Valuation Project. The project was funded by the DFID and implemented by the WorldFish Center and the Department of Fisheries (DoF) of Cambodia. The purpose of the profile is to gather and present important data and information useful for community-based aquatic resources management in the villages.

This publication is part of a collection of three profiles covering nine aquatic resources-dependent villages in the provinces of Stung Treng, Takeo and Siem Reap. The profiles are important because in most, if not all, of the aquatic-resources villages of Cambodia, critical data and information useful for planning and management are not available in a documented form. The development of the village profiles is viewed as a basic requirement for planning and overall management. It is only an initial step to identify future programs and projects related to aquatic resources.

The profiles depict the present state of the villages and their aquatic resources. In general, the villages have limited infrastructure and other physical resources. In the villages of Takeo and Siem Reap, total flooding occurs in the wet season and villagers must rely on transportation by boat. In Stung Treng villages, partial flooding is also a problem as it makes the few existing roads significantly impassable during the wet season.

In terms of social concerns, health care services are limited in all villages and thus sickness is common. Many households have no toilets and so water bodies and open fields are used for discharging domestic wastes. Many villagers are unable to read and write due to the lack of education, and educational services in the villages are limited to primary schools.

Most villagers derive their income from occupational sources, rice farming and fishing being the main primary and secondary occupations. Many of them, particularly those belonging to lower income groups, have few or no alternative occupations and those in dire need of money usually borrow at prohibitive rates of interest, mainly from private lenders.

Community Fisheries Management

In general, villagers are dependent on aquatic resources not only for fishing but also for other livelihood activities including fish processing and the gathering of aquatic plants, animals and wood among others. The majority of households in the villages that belong to the lower wealth category depend to a significant extent on available aquatic resources for subsistence and survival.

The villages have access to vast aquatic resources including the Mekong River in Stung Treng, floodplains in Takeo, and the Tonle Sap Lake in Siem Reap as well as other smaller water bodies. Some villages have flooded forests and fishing lots that are now either fully or partially converted for public use. Flooded forests are also sources of wood for villagers. In general, the villages that are entirely flooded in the wet season in Takeo and Siem Reap provide areas for fishing and other aquatic resources-based livelihoods for the villagers.

The villagers face important management issues related to the use of aquatic resources that include illegal fishing, increasing number of fishermen, clearance of flooded forests, poor monitoring and enforcement by authorities and other issues. They also face direct access issues related to the use of aquatic resources including the payment of access fees, the presence of fishing lots, the presence of fish sanctuaries and/or the imposition of closed seasons. For the most part, villagers are to some extent aware of overall aquatic resource conditions in their villages and have proposed certain measures to improve on their management.

At present, many of the villages have already formed Community Fisheries Committees tasked to manage these resources. However, these committees have been unable to fully discharge their intended duties and functions because of limitations in financial resources and inadequate knowledge among members in aquatic resource management. Other than these committees, the villages have existing common administrative organizational structures that attend to management matters.

In conclusion, with the inadequacy of documented data and information these village profiles, drawn from the villagers themselves, provide a clearer and more definite reflection of these communities and the aquatic resources to be managed. The data and information presented here provide a general background to the villages and their aquatic resources. It is hoped that these profiles will be useful in future planning and management activities in the villages.

Introduction

This village profile presents a summary of the demographic, socioeconomic, management and other related data and information gathered for the three villages of Tboung Kla, Koh Chruem and Ou Chralang in Ou Mreah commune, Stung Treng province. The data were gathered from household cross-section surveys, household longitudinal monitoring, participatory rural appraisals (PRA) and provincial workshops conducted from 2003 to 2004.

The data presented in this profile as well as additional information on the villages are also contained in Israel et al. (2005a, 2005b). The objective of the profile is to provide an information base for future research and development activities in the villages, particularly for aquatic resources management. The profile reflects the collective output of collaboration and consultation with village communities.

Stung Treng province is located in the northeastern side of Cambodia; in 2004 the population just exceeded 92 000. It is bordered in the north by Lao PDR, in the south by Kratie province, in the east by Ratanakiri province, and in the west by Preah Vihear province (Figure 1). With a land area of 11 110 square kilometers, Stung Treng province has a population density of 8.3 persons per square kilometer; it has five districts, 34 communes and 128 villages.

Ou Mreah commune is located in Siem Bouk district (Figure 2). It is bordered in the north by Sre Krosang commune, in the south by Ou Kreang commune of Kratie province, in the east by Ou Russei-Kandal commune and in the west by Siem Bouk commune. The main body of water in the commune is the Mekong River.

Ou Mreah commune has four villages, with a total commune population close to 1 600 persons in 2004. Of the people in the commune, 60 percent are Khmer, 35 percent are Kouy, 4 percent are Lao and 1 percent is Phnong (Figure 3).

This profile provides a background to the three villages of Tboung Kla, Koh Chruem and Ou Chralang, in the Ou Mreah commune. The first section provides a description of the physical, natural, human, financial, and social capital as well as the administrative structures of each village, while the second section provides a profile of the livelihoods, vulnerability, stakeholders, and access and management issues faced by the villages. Additional data on selected household characteristics is presented in Appendix 1.

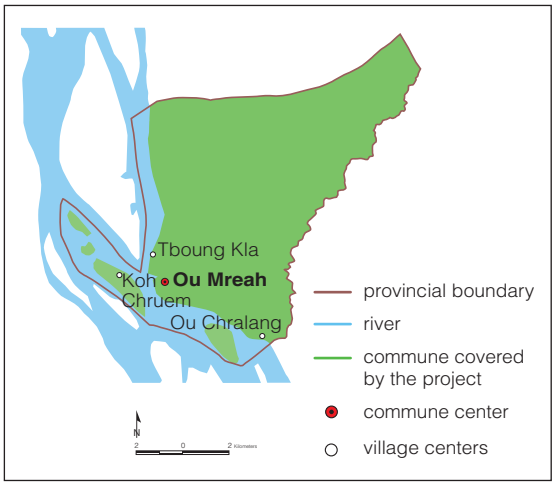

Figure 2: Map of Ou Mreah commune

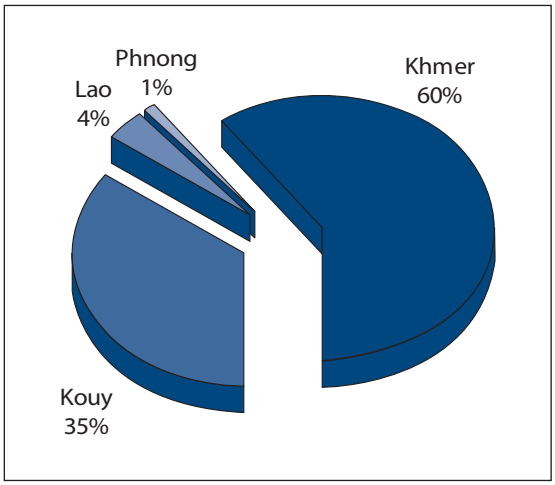

Figure 3: Ethnicity of the Ou Mreah commune

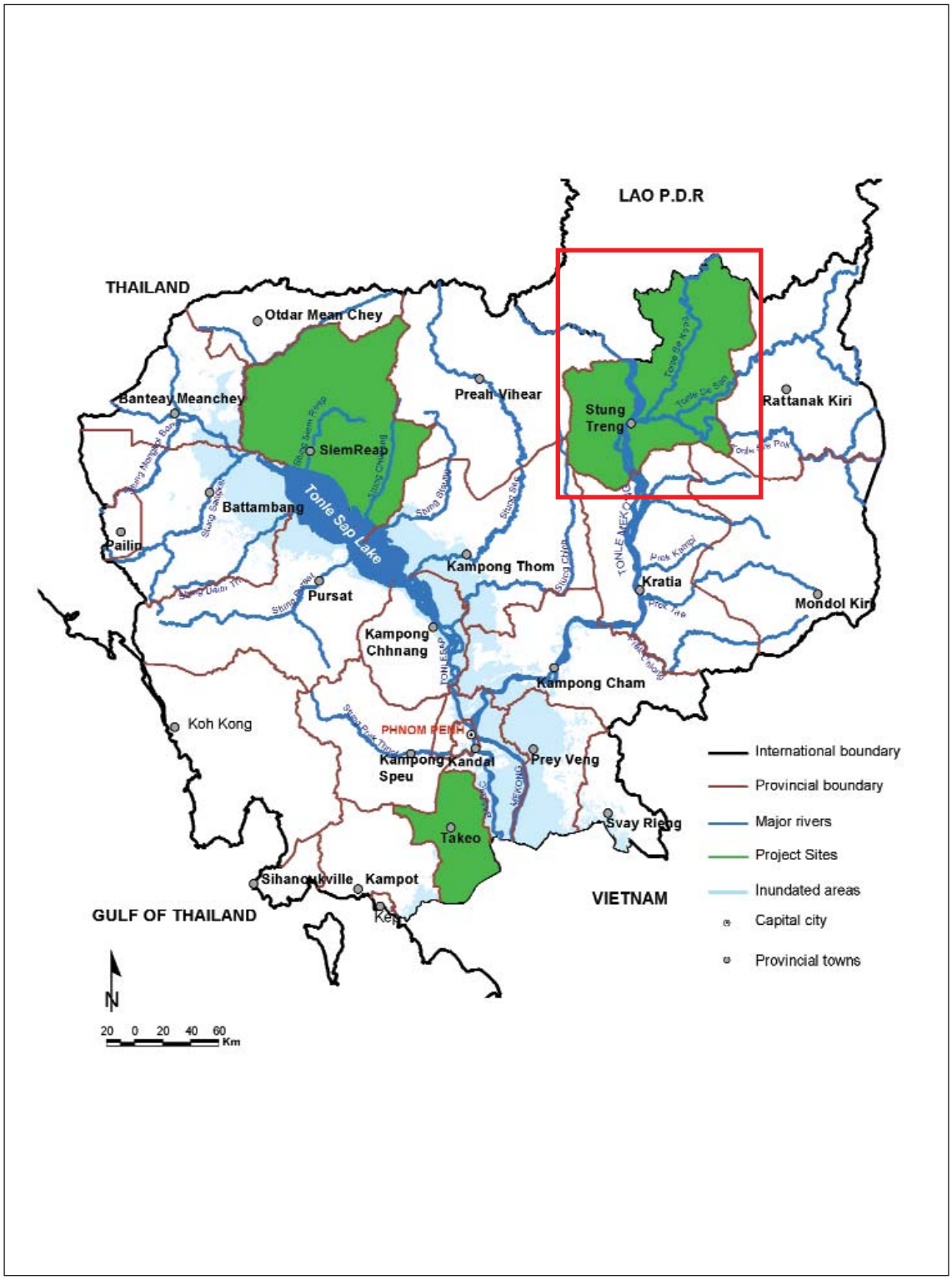

Figure 1: Map of Cambodia and the provincial sites of the Mekong Valuation Project highlighting Stung Treng province






Village Resources

Tboung Kla, Koh Chruem and Ou Chralang Village

Tboung Kla

Physical Capital

Tboung Kla is bordered by Sre Krosang village in the north, Ou Russei Kandal and Ou Mreah villages in the east, and the Mekong River in the south and west (Figure 4). The exact total land area of the village is not known. It is the seat of government of Ou Mreah commune and also serves as a police outpost. The village has a pagoda, primary school, military outpost, health center and a few stores. It has 4 roads totaling 24 kilometers, 9 of which are flooded during the wet season which makes transportation difficult.

The village has 23 motorized boats and 91 non-motorized boats. The boats are used for fishing as well as for the transportation of people and goods during both the dry and wet seasons. There are 2 tractors in the village used for tilling the land in addition to 250 water buffalos. The village also has 7 rice mills.

The source of power in the village is a privately owned generator. Some households use batteries that are recharged by the generator. Other households use fish-oil-based lamps and resin-based torches for lighting. For cooking, wood is gathered from upland forests. The trees that grow along the banks of the Mekong River are not used for any household purpose.

The main source of drinking water in the village is the Mekong River, however during the wet season rainwater is also utilized. Most households allow the sediments in the water to subside to the bottom of the container before drinking. In some cases, drinking water is boiled or filtered. There is also a water pump in the village for use by people in the pagoda and in the primary school. A few of the households own television, radio, karaoke or video machines. The lone fish trader owns a radio communication system, which is used for communicating with other units in the villages and the province. Three other units are in use by the commune head and the police.

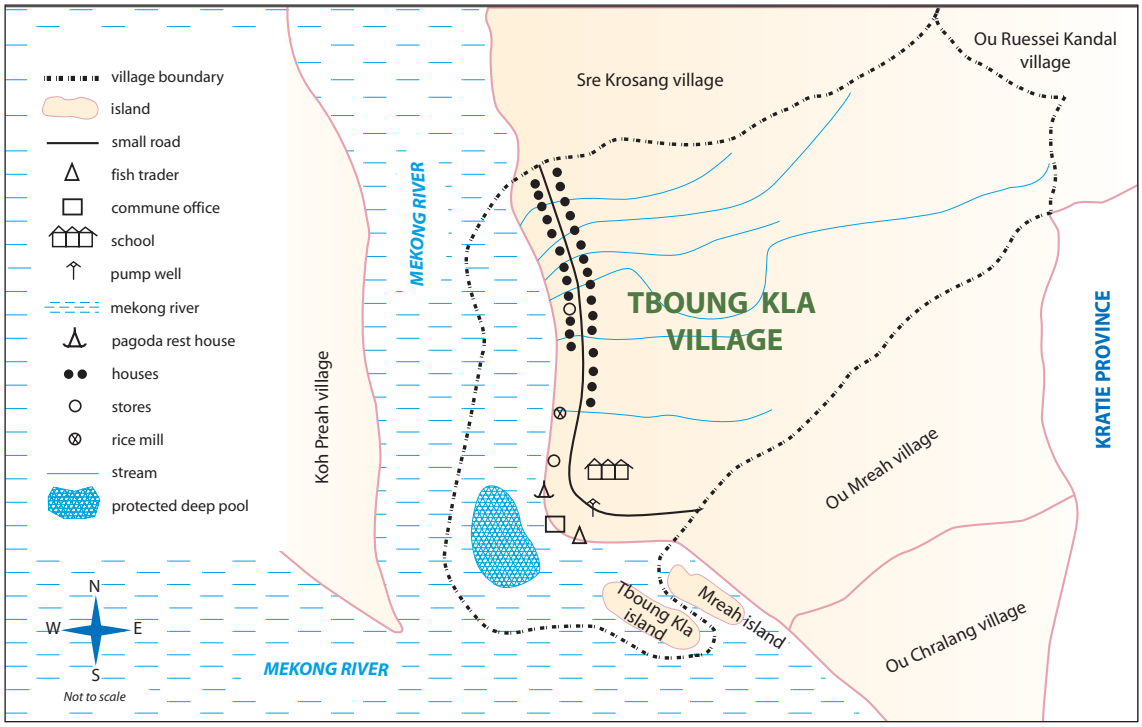

Figure 4: Physical map of Tboung Kla village

Of the houses in the village, most are made of wood. About 70 percent of the houses have roofs or walls made of palm leaves, the rest have roofs made of zinc or fibro cement. About 80 percent of the households do not have toilets and use the fields and the river for excreting human waste. Only about 20 percent of the households have formal toilets.

In general, the residential and agricultural lands in the village are privately owned. There used to be a small irrigation system but it is no longer in operation.

Natural Capital

Tboung Kla village has substantial natural resources (Figure 5). It has a large area of freshwater resources that include the Mekong River and four small streams, as well as forest and agricultural resources. The actual village area and area covered by forest is not known. Forest resources provide wood and other forest products for villagers, whereas water resources are mainly utilized for fishing, transportation and domestic activities. The total agricultural area is estimated at 107 hectares. About 85 percent of the agricultural land is used for rain-fed rice farming, 10 percent for growing corn and the remainder is for the cultivation of fruits, vegetables and other crops.

The village has one big pool and one small pool in the Mekong River and three other fishing areas in other parts of the river. The villagers estimated that the fish species caught in the village comprise of trey kaek (30 percent), trey kray (25 percent), trey chlang (20 percent), trey tro-nel (10 percent), trey chlat (10 percent) and others (5 percent) (Figure 6).

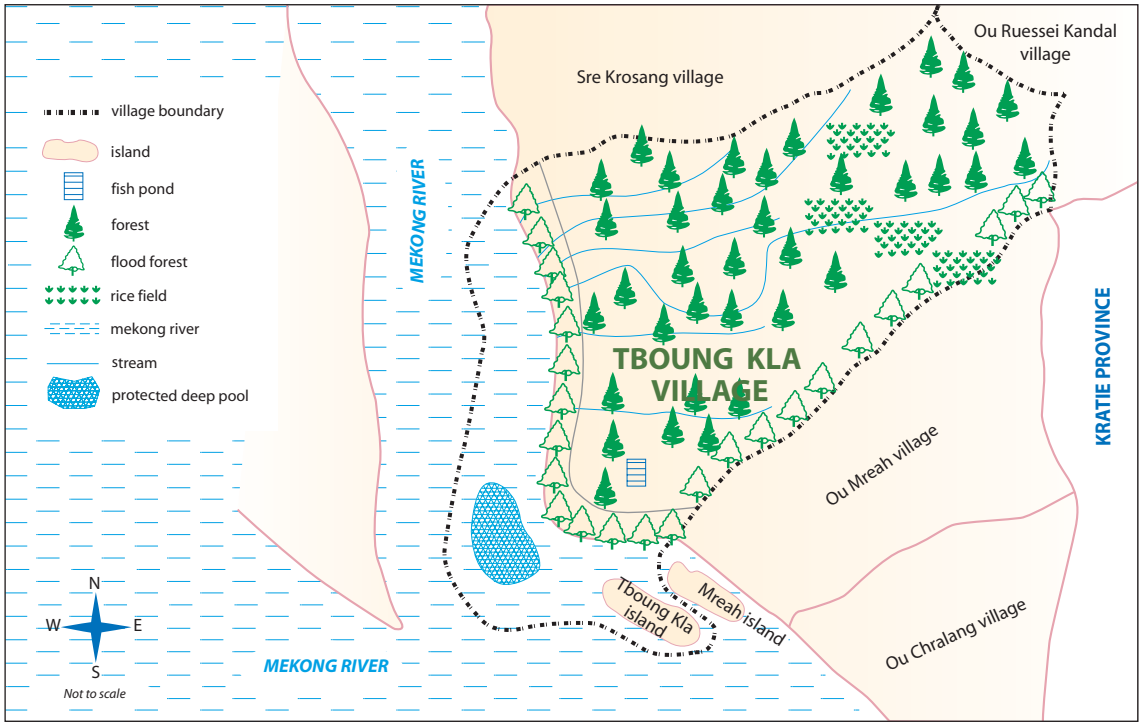

Figure 5: Natural resources map of Tboung Kla village

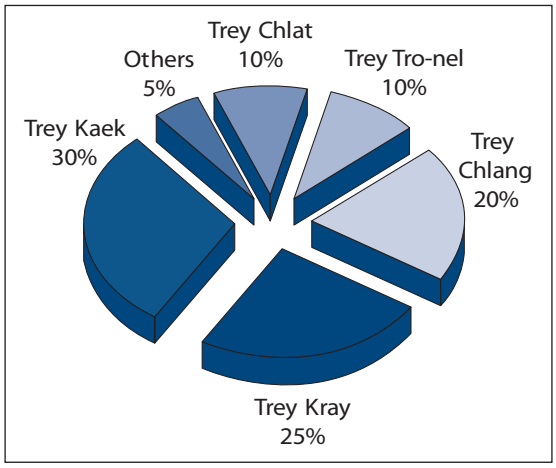

Figure 6: Main fish species caught in Tboung Kla

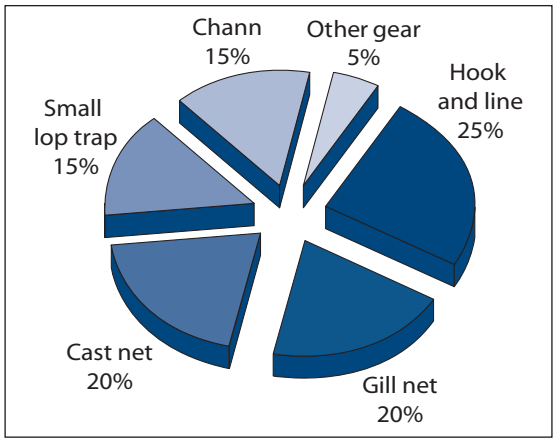

Figure 7: Type of gear used by households to catch fish in Tboung Kla

According to villagers, fishing gears used in the village include hook and line (25 percent), gill net (20 percent), cast net (20 percent), small lop trap (15 percent), chann (15 percent) and other fishing gear (5 percent) (Figure 7). Fishing is generally small-scale with 80 percent of the fishers owning smaller boats while 20 percent operate bigger boats. Large scale and medium scale fishing is illegal in the village however, these activities still occur from time to time.

Human Capital

In 2004, Tboung Kla had a population of 673 persons of which 331 were men and 342 were women. The village had 138 households with an average household size of 4.9 persons. Sixty percent of the villagers are Khmer while 40 percent are Kouy. All of them are Buddhist.

Nearly half of the people in Tboung Kla can read and write in Khmer; no one knows English. Many villagers are uneducated or only have primary level education. The primary school in the village has 5 teachers and 162 students. The few students who aspire for secondary education have to go to the district or provincial capital. The main reasons for the inability of students in the village to pursue education beyond the primary level are the lack of financial resources and the need to assist in household and farming chores.

The incidence of sickness among villagers in Tboung Kla is high. The villagers estimated that about 50 percent of the adults and 70 percent of the children reported getting sick every year. The most common diseases are malaria, headache, fever, and diarrhea. When they get sick, villagers either take a rest from work or continue their work without medication. Otherwise, they get medication from the health center, usually for free, or buy it from one of the few village and provincial capital stores. Some villagers reported that they borrowed money for buying medicine. Some villagers said that they produced traditional medicine at home. Aquatic plants and animals are used for the production of traditional medicine. Doctors seldom visit the village and their activities usually relate only to training in the medication of the sick, not in actual curative measures. A few non-governmental organizations (NGOs) - the Red Cross and Community Aid Abroad - were once involved in helping the village establish toilets and promote water treatment.

The households of Tboung Kla belong to different wealth classes but in general they can be classified into higher, medium, and lower wealth households. The villagers provided the criteria for wealth ranking in their village (Table 1). Sixty percent are lower wealth, 30 percent are medium wealth and 10 percent are higher wealth. Compared to other villages in the commune, the villagers considered Tboung Kla to be ranked as a relatively higher wealth village. The wealth ranking by occupation indicates that the medium and lower wealth households are likely to depend more on aquatic resources than the higher wealth households because they have fewer alternative livelihood opportunities.

Table 1: Wealth ranking of households in Tboung Kla village

Characteristics	Higher wealth households	Medium wealth households	Lower wealth households
Area of owned land	2 ha of agricultural and house land	0.5 -< 2 ha of agricultural and house land	< 0.5 ha of agricultural and house land
House type	Big house with zinc roof	Average house with palm leaves roof	Small house with palm leaves roof
Occupation of household head	Rice miller, video service, rice farmer, sales	Rice farmer, fisher, crop farmer	Fisher, manual laborer
Other things owned	Generator, motor boat, cassette player, I-com, boat, motorbike, agricultural tools	Motor boat, cassette player, motorbike, fishing gears and tools	Small boat, small fishing gear, few agricultural tools
Animals raised	10-15 buffalos and cows, 3 pigs, 20 chickens and ducks	3-5 buffalos and cows, 2 pigs, 5-10 chickens and ducks	1 pig, 3 chicken, 5 ducks

Financial Capital

Most of the people in Tboung Kla village derive their income from occupational sources such as farming and fishing; a few get their income from the leasing of properties. None of them receive income support from relatives or any other sources outside of the village. About 20 percent of the villagers were reported to have saved and kept money in their houses, which is used later to purchase farm animals and household necessities. A greater number of villagers, nearly 40 percent, borrow money from lenders and neighbors for various reasons, including incidences of sickness or accidents, to finance a wedding, or to buy food.

In some instances, borrowing in the village is in-kind and also paid in-kind, for example when rice is the commodity borrowed and it could be paid for with labor service. Previously, a rice bank, run by an NGO, in the village supported rice production activities such as seed provision. However, this bank is no longer in operation. Interest rates on borrowed money are generally prohibitive which discourages many villagers from borrowing. Sometimes, villagers borrow rice and also pay back in rice. The pay back is usually 50 percent more of the quantity of rice borrowed within one cropping season.

Collateral is usually not required since borrowing agreements in the village are done in good faith and trust. Money lenders usually assess the paying capability of borrowers by looking into their income and property holdings. There are instances when people cannot pay back their borrowings, thus lenders are forced to take away some of their assets, such as farm animals, as payment. In most households, women usually handle the family purse and see to the family expenditure. The borrowing and lending of money to other households are mutually decided between husband and wife.

Social Capital

Tboung Kla is a socially integrated village where trust and goodwill among villagers exist. The village celebrates social activities that are similar to all other villages in the commune (Table 2).

The committee of elders that runs the pagoda, the village head and the Village Development Committee usually take the lead in the above celebrations and social activities; they are supported by other active members and the general population. Women, youth and children participate in most of these village activities. In general, the villagers have good relationships with each other but unavoidably misunderstandings sometimes occur that are resolved by neighbors and village elders.

Table 2: Celebrations and social activities in Tboung Kla village

Month	Name of celebration	Description
February	Bon Da Lean	Celebration of rice harvest
February-March	Bon Meak Bochea	Commemoration of the spontaneous gathering of monks to listen to Buddha's preaching
April	Chol Chhnam Khmer	Celebration of Khmer New Year
May	Bon Pisaak Bochea	Commemoration of the birth of Buddha
July	Chol Vosa	Celebration of the start of the wet season
September-October	Bon Phchum Ben	Offering of food for the dead
October-November	Chenh Vosa	Celebration of the end of the wet season
October-November	Bon Kathen Tean	Contribution of money for the support of the pagoda

Village Administration

Tboung Kla is administered by a village head; under this office is the Village Development Committee that includes a chief, chief of the rice bank, a cashier, and a member (Figure 8).

The village has a Community Fisheries Committee that is headed by a chief and assisted by the vice chief, a cashier, a secretary and a member (Figure 9). This committee is in charge of the management of the fisheries and aquatic resources of the village.

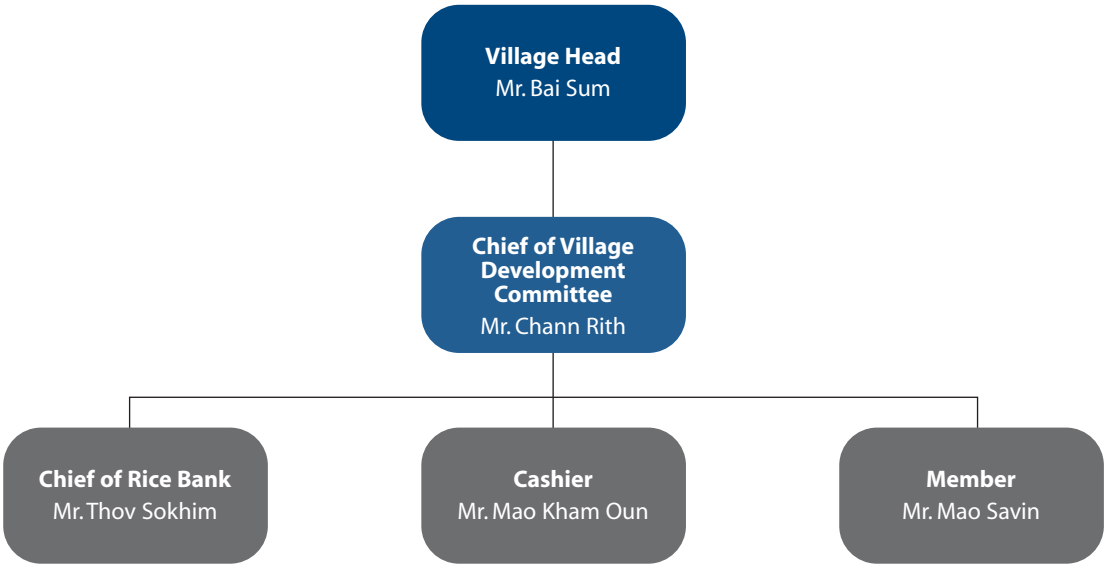

Figure 8: Tboung Kla village organization chart

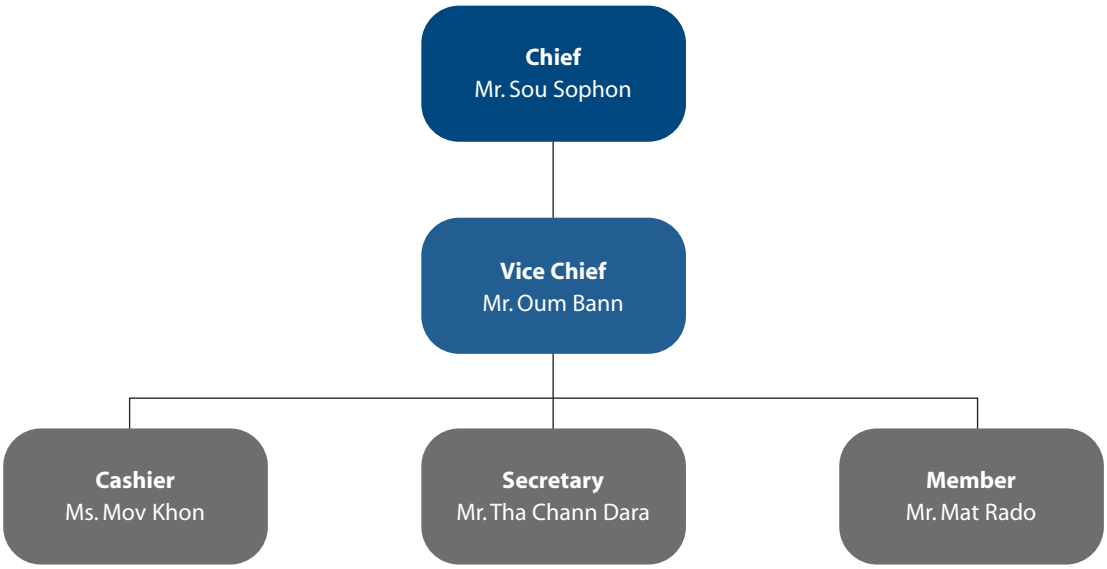

Figure 9: Tboung Kla village community fisheries committee chart

Koh Chruem

Physical Capital

Koh Chruem is an island village bordered on all sides by the Mekong River (Figure 10). The village has a land area of about 272 hectares. It has a pagoda, a primary school, and a few stores. Its total road length is 3 kilometers with 4 bridges. The road is impassable during the wet season, some sections being adjacent to the river. Villagers use the Mekong River for transportation during both the dry and wet seasons as an alternative to the road. About 20 percent of the boats in the village are motorized while 80 percent are non-motorized.

The sources of lighting in Koh Chruem are kerosene-based lamps, fish-oil-based lamps, resin-based torches, and batteries that are recharged by a generator in the neighboring Tboung Kla village. Wood gathered from upland forests are utilized as the main source of cooking fuel in the village. Trees that grow along the banks of and in the neighboring islands in the Mekong River are generally not used for any household activity.

Like the other villages in the Ou Mreah commune, the most important source of drinking water in Koh Chruem village is the Mekong River, however during the wet season rainwater is also utilized. Before drinking, water sediments are allowed to settle to the bottom of the container; water is also boiled or filtered. Some households in the village own radios, televisions and video machines powered by batteries. One household involved in fish trading owns an I-Com, a radio communication device.

About 60 percent of the houses in Koh Chruem are made of wood and have roofs or walls made of palm leaves; while approximately 40 percent are made of wood with roofs made of zinc. Only 30 percent of the villagers have toilets, made with the help of NGOs, while the majority, 70 percent, use fields and the Mekong River for discharging their wastes.

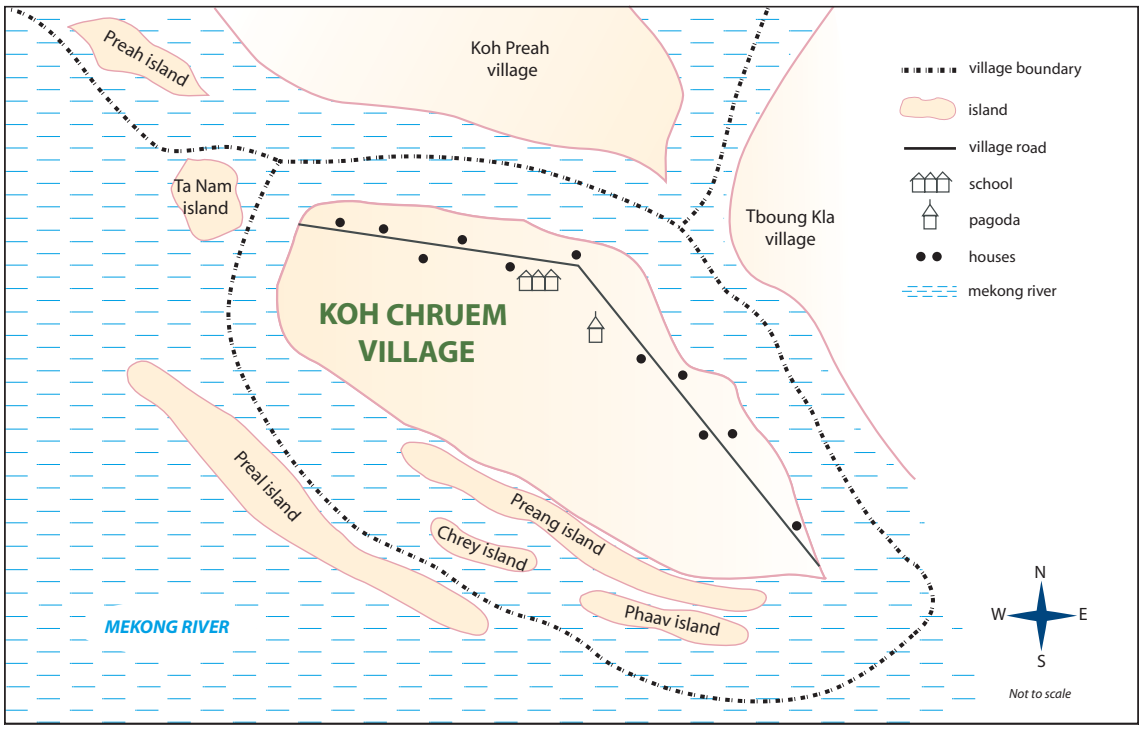

Figure 10: Physical map of Koh Chruem village

As in the other villages in the Ou Mreah commune, residential and agricultural lands in Koh Chruem are under private ownership. Land preparation work for agriculture is usually done using water buffalos. Villagers also own other farm animals like cows, hogs and poultry. There is no irrigation system in the village.

Natural Capital

Koh Chruem has no significant forest resources since it is an island village (Figure 11). However, it has freshwater resources that include the Mekong River and four small streams in addition to agricultural land. The village has two deep pools. The agricultural land is mostly planted for rain-fed rice but some portions are used for farming other crops including vegetables.

Villagers estimated that fish species caught in Koh Chruem consisted of trey chlang and trey pa see (30 percent), trey kray (25 percent) trey tro-nel (15 percent) and trey kaek and trey ombong (20 percent) and other species (10 percent) (Figure 12).

The fishing gears used in the village include hook and line (40 percent), gill net (30 percent), cast net (15 percent) and small lop trap and chann (15 percent) (Figure 13). Fishing is generally small-scale with 90 percent of the fishers owning smaller boats while 10 percent use bigger boats.

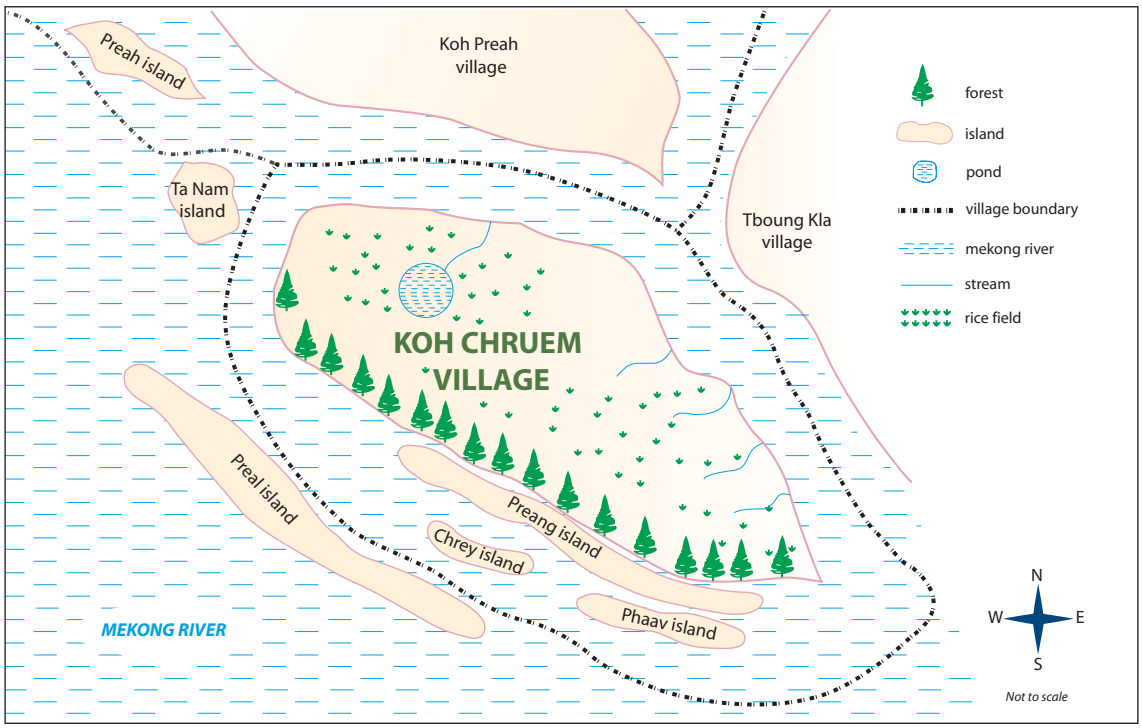

Figure 11: Natural resources map of Koh Chruem village

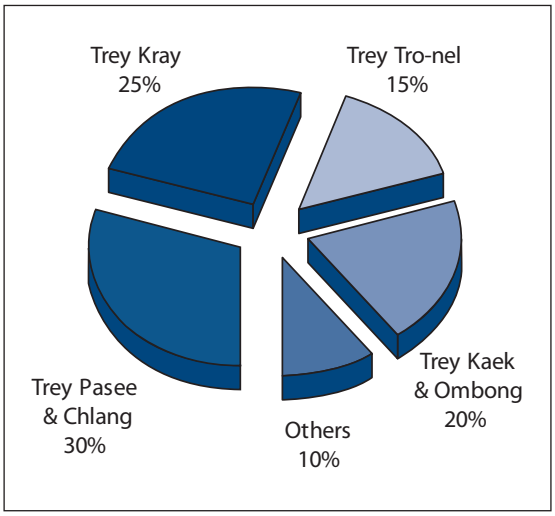

Figure 12: Main fish species caught in Koh Chruem

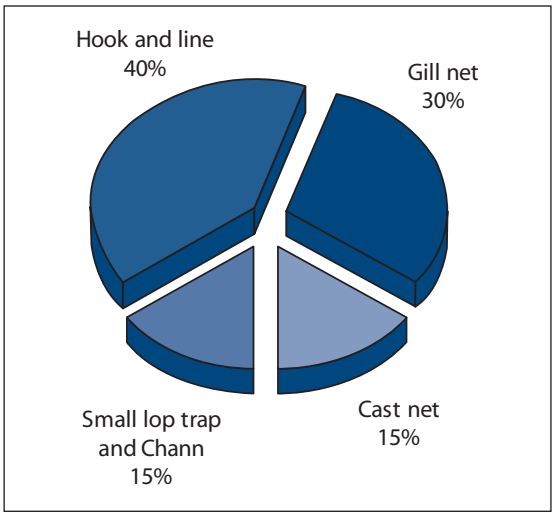

Figure 13: Type of gear used by households to catch fish in Koh Chruem

Human Capital

In 2004, Koh Chruem had a population of 586, of which 285 were men and 301 were women. It had 118 households with an average household size of 5 persons. The population density of the village is 2.2 persons per hectare. Approximately 90 percent of the people are Khmer, 5 percent are Kouy and 5 percent are Chams. About 95 percent of the villagers are Buddhist while 5 percent are Muslims.

Twenty five percent of the villagers in Koh Chruem can read and write in Khmer, though no one can do so in English. Approximately 30 percent of the population has received no education, and 20 percent has only a primary education. The primary school has two rooms and houses 149 students with two teachers. The few students who aspire to secondary education in the village go to the district or provincial capital. As in the other villages in the commune, the main reasons for poor educational attendance are the lack of money and the need to assist in household and farming chores.

Sickness is a major problem in the village. Approximately half the adults and a quarter of the children have been reported to get sick annually. Malaria, headache, fever, high body temperature and diarrhea are the illnesses most frequently reported. As in other villages in the commune, when villagers are sick they either take a rest, keep working without medication, buy medicines from village or provincial capital stores, or produce traditional medicine at home. The villagers produce their own traditional medicine from some of the aquatic plants and animals.

In general, doctors and other health workers from the government do not visit Koh Chruem. For the higher income households, private doctors come to the village upon their request. In the past, a few non-governmental organizations visited the village to assist in the construction of toilets. Villagers seldom go to the health center in Tboung Kla for medical assistance and treatment. In general, poor people in the village do not have enough money to send their sick relatives to hospitals in the province.

The villagers provided the basis for ranking households in their village in terms of wealth (Table 3). Of the village households, 64 percent are considered as low in wealth, 28 percent have medium wealth, and only 8 percent have higher wealth. The villagers rated their own village as having relatively medium wealth compared to the other villages in the commune. The wealth ranking by occupation indicates that the medium and lower wealth households are more likely to depend on aquatic resources because they have fewer alternative occupations than higher wealth households.

Table 3: Wealth ranking of households in Koh Chruem village

Characteristics	Higher wealth households	Medium wealth households	Lower wealth households
Area of owned land	1.5 - 2 ha	0.75 - 1 ha	0.30 - 0.70 ha
House type	7m x 9m Roof made of zinc, tile or fibro cement Wall and floor made of wood	5m x 7m Roof made of palm leaves Wall and floor made of bamboo, zinc or wood	3.5m x 5m Roof made of palm leaves Wall and floor made of bamboo
Occupation of household	Wood and rice miller, fish trader, video and karaoke service provider, rice farming	Rice farmer, fisher, crop and vegetable farmer	Crop farming, fisher and laborer
Other things owned	Video, rice miller, furniture, motorized boat	Rice miller, motorized boat	Small boat
Animals raised	7 buffalos, 10 cows and 100 others animals	3 buffalos, 2 pigs, 30 chickens and ducks	1 pig, 5 chicken, 7 ducks

Financial Capital

About 95 percent of the villagers in Koh Chruem derive their income from occupational sources alone, while 5 percent also get some money from leased properties. No household receives income support from relatives or from other sources outside of the village. Only 2 percent of the people save money, which is usually kept at home. As a form of investment, they later use their savings to buy buffalo and other farm animals. Thirty percent of the villagers used to borrow money from the rice bank, set up by an NGO, to buy seeds and disease treating chemicals before it stopped operating.

Thirty percent of villagers also borrowed cash or goods and services in-kind from neighbors, particularly in times of emergency. Often borrowing is paid in-kind, such as when rice is borrowed and paid for in the form of labor service. Collateral is usually not required when villagers borrow from neighbors and relatives because it is done based on good faith and trust. In households, women usually handle the family purse and expenditures; whereas borrowing and lending money to others is mutually decided between husband and wife.

Social Capital

As in Tboung Kla village, the people of Koh Chruem considered their village to be a socially integrated one where people cooperate with each other. The celebrations and social activities celebrated by the village are the same as those in Tboung Kla and other villages in the commune (refer to Table 2).

Village Administration

The village head runs the Koh Chruem village, under the village head are the chiefs of eight groups of households (Figure 14). Koh Chruem also has a village development committee that is managed by a chief and assisted by a vice chief, cashier, secretary, and two members (Figure 15).

The village has a Community Fisheries Committee. The chief runs the committee with a vice chief, while the cashier, secretary and member report to him (Figure 16). The Committee is in charge of the management of the fisheries and aquatic resources of the village.

The village also has a Community Rice Bank Committee to manage the distribution of rice seeds. It is headed by a chief, with a secretary, inspector and a member as his subordinates (Figure 17).

The village has a Community Ceremony Committee to run the ceremonies and social affairs of the village. The chief runs the committee with the assistance of a vice chief, secretary, cashier and three members (Figure 18).

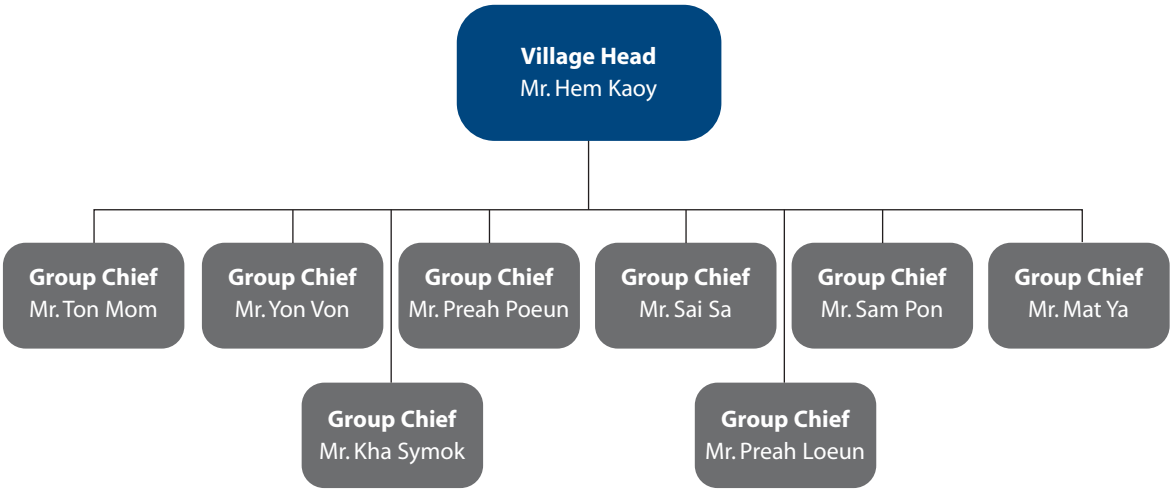

Figure14: Koh Chruem village organizational chart

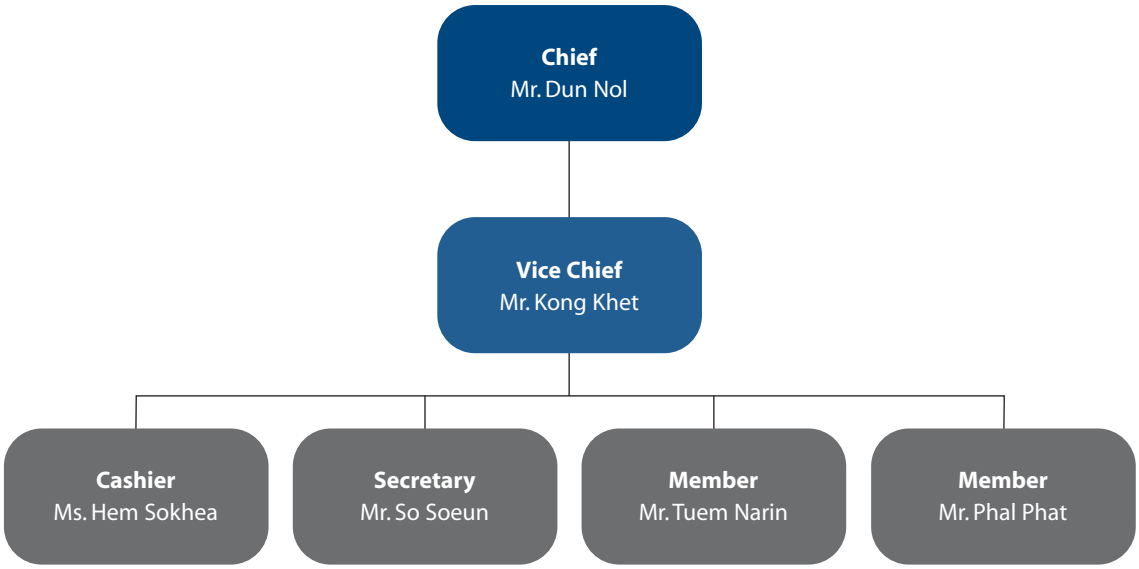

Figure 15: Koh Chruem village development committee chart

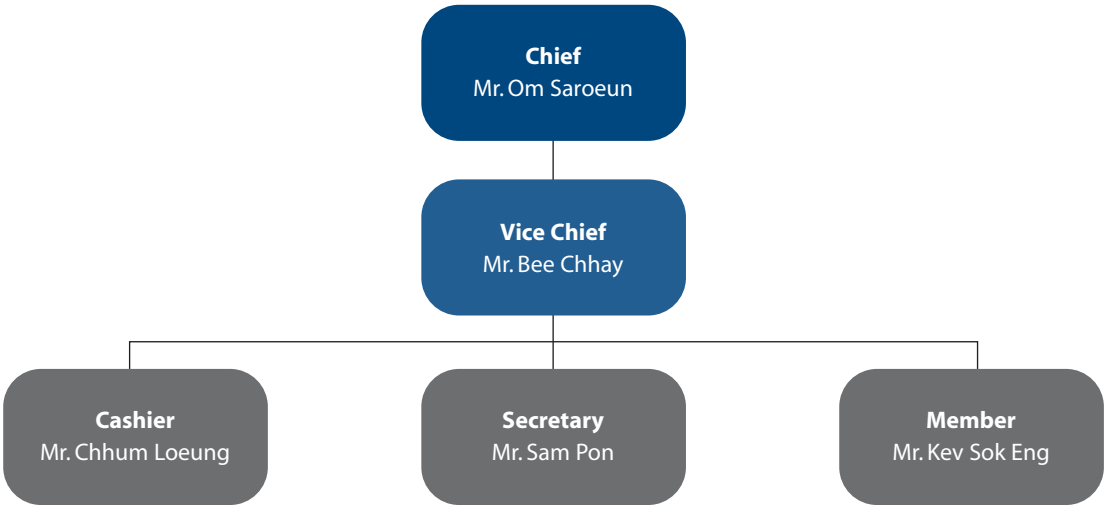

Figure 16: Koh Chruem village community fisheries committee chart

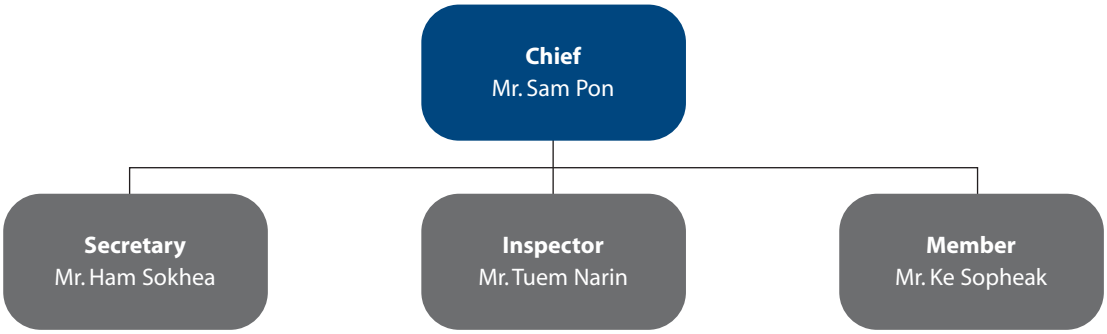

Figure 17: Koh Chruem village rice bank committee chart

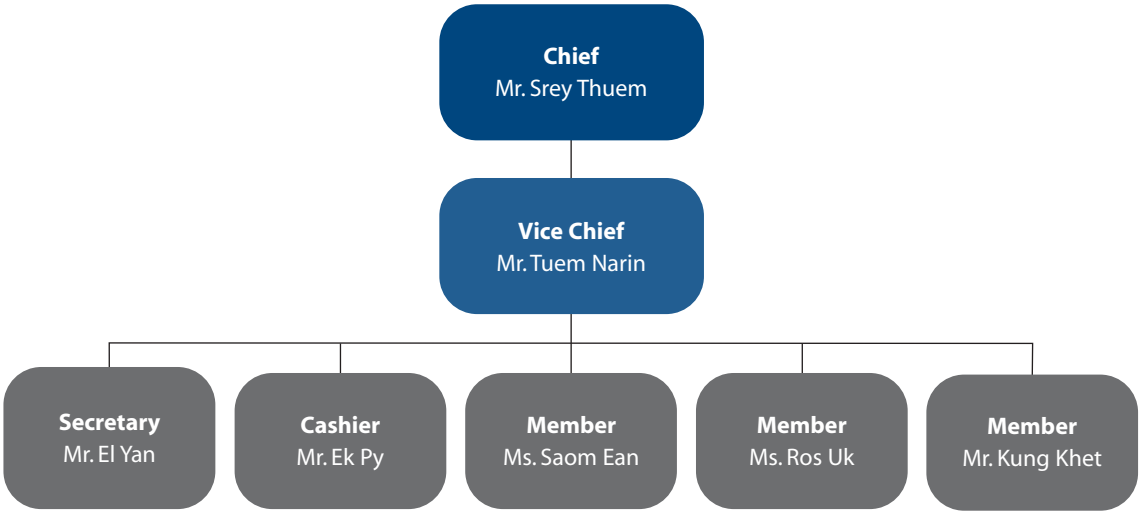

Figure 18: Koh Chruem village community ceremony committee chart

Ou Chralang

Physical Capital

The village of Ou Chralang is bordered in the north by the Ou Mreah village, in the west and south by the Mekong River, in the east by Kandal commune, and in the west and south by Kratie province (Figure 19). The exact area of the village is not known. It has a pagoda, primary school, a few stores and some rice mills. The 2 kilometer road which connects it to other villages is inadequate and is impassable during the wet season. Villagers use the Mekong River for transportation during both the dry and wet seasons. About 20 percent of the boats in the village are motorized while 80 percent are non-motorized.

The sources of lighting for the village are kerosene-based lamps, fish-oil-based lamps and resin-based torches for lighting. Wood gathered from upland forests are utilized as the main source of cooking fuel. Trees that grow along the banks and in river islands are generally not used for any household activity.

The most important source of drinking water in the village is the Mekong River, though during the wet season rainwater is also used. Before drinking, water sediments are usually allowed to settle to the bottom of the container. Oftentimes, drinking water is also boiled or filtered. Some of the households in the village own radios but not televisions, because there is no electricity available.

Ninety percent of the houses in the village are made of wood with roofs or walls made of palm leaves, while 10 percent are made of wood with roofs made of zinc. Only 10 percent of the villagers

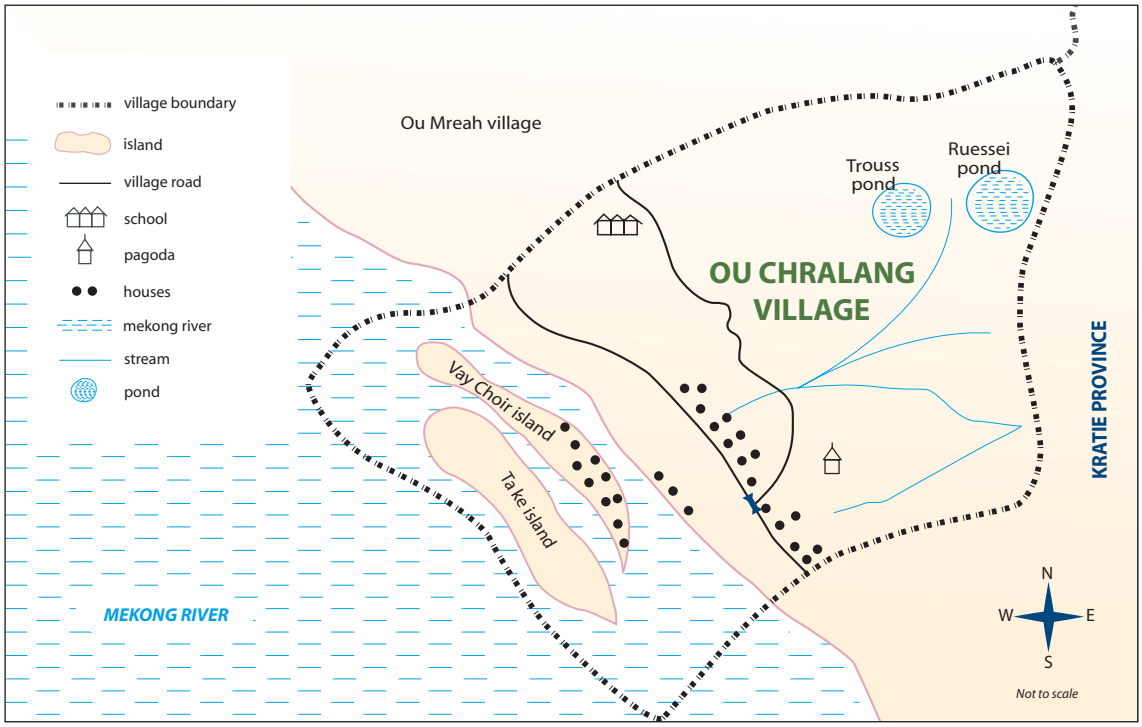

Figure 19: Physical map of Ou Chralang village

have toilets while 90 percent use the fields and the Mekong River for discharging their wastes.

Residential and agricultural lands in the village are generally in private ownership. Buffaloes are used to prepare land for agriculture. Villagers also own other livestock like cows, hogs and poultry. There is no irrigation system in the village.

Natural Capital

Ou Chralang has a forest area of about 10 - 40 hectares which are mostly flooded forests and agricultural land of about 30 hectares. Freshwater bodies include the Mekong River and a village stream (Figure 20). The forest serves as a source of wood and other forest products for villagers while water resources are mainly utilized for fishing and transportation. Agricultural land is mostly planted with rain-fed rice but some portions are also used for farming other crops including fruits and vegetables.

The villagers estimated that the fish species caught in the village include trey kaek (70 percent), trey riel (20 percent), trey kya (5 percent), and other species (5 percent) (Figure 21).

The major fishing gears are hook and line (40 percent), cast net (40 percent), small lop trap (10 percent) and chann (10 percent). Fishing is generally small-scale with one half of the fishers owning smaller boats while the other half uses bigger boats. Large scale and medium scale fishing is illegal in the village and province (Figure 22).

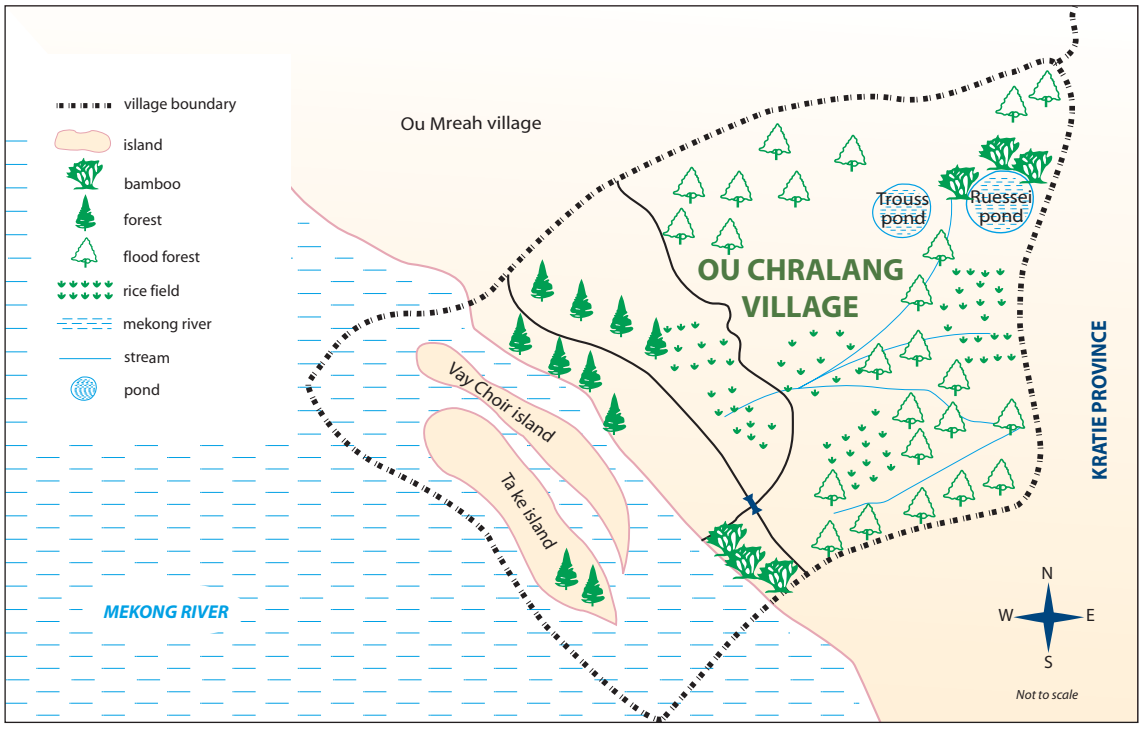

Figure 20: Natural resources map of Ou Chralang village

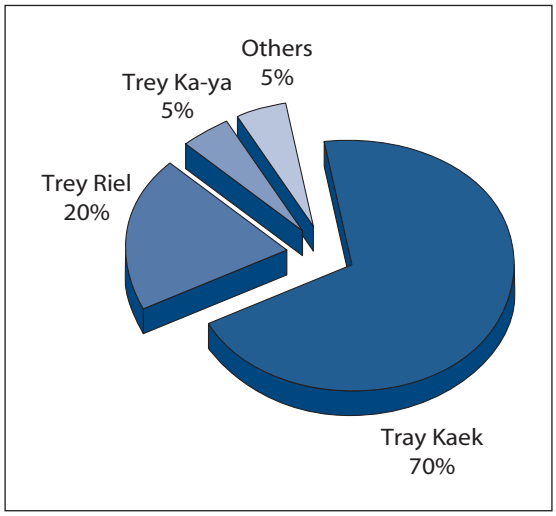

Figure 21: Main fish species caught in Ou Chralang

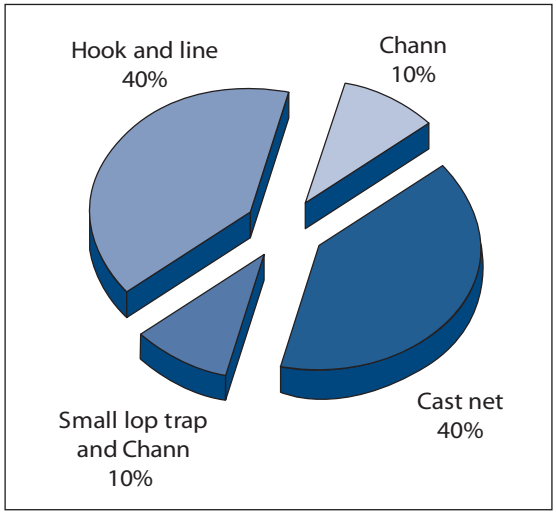

Figure 22: Type of gear used by households to catch fish in Ou Chralang

Human Capital

In 2004, the population of Ou Chralang was 245, of which 128 were men and 117 were women. The village has 47 households with an average household size of 5.2 persons. About 80 percent of the people in the village are Khmer, 15 percent are Lao and 5 percent are Phnong. All of the villagers are Buddhist.

Among the villagers, 70 percent can read and write in Khmer, but no one can read or write in English. Most of the villagers only have primary education or are uneducated. The primary school has 2 teachers and 3 rooms. The few students who aspire to go to secondary education have to go to the district or provincial capital. Presently, nobody from the village is attending college. As in the other villages in Ou Mreah commune, the reasons behind poor schooling attendance are the lack of money and the need to assist in household and farming chores.

Sickness is a major problem in the village, with about 30 percent of the adults and 90 percent of the children reportedly getting sick annually. The most prominent diseases are malaria, headache, fever and diarrhea. When villagers are sick, they either take rest; keep working without medication, or get medicine from the health center, usually for free. The villagers seldom go to the health center in Tboung Kla for medical assistance and treatment because it is too far. Doctors and other health workers in general do not visit the village. No NGO has worked in the village. Medicine can be bought in village stores or in the provincial capital. Otherwise it is produced as traditional medicine in households. Some aquatic plants and animals are utilized in the production of traditional medicine.

The people in Ou Chralang belong to different wealth classes but in general they can be classified into higher, medium and lower wealth households (Table 4). The villagers of Ou Chralang estimated that 84 percent of them are in the lower wealth class, 8 percent are considered in the medium category and 8 percent are also in the higher wealth category. They also feel that, compared to the other villages in the commune, their village is the poorest.

Financial Capital

In Ou Chralang, 90 percent of the villagers derive their income from occupational sources alone, while 10 percent acquire some revenue from leased properties. None of the villagers receive income support from relatives or other sources outside of the village. About 20 percent of them saved money in their homes. Later on they use their savings to invest in buffalos or other farm animals. In general, villagers do not borrow money, though in times of emergency they seek help from neighbors and relatives for money or goods in-kind.

Table 4: Wealth ranking of households in Ou Chralang village

Characteristics	Higher wealth households	Medium wealth households	Lower wealth households
Area of owned land	40 x 100 m of house land 200 x 100 m of rice land 2 ha of crop land	20 x 30 m of house land 2 ha of crop land	0.7 ha of crop land
House type	Wall and floor made of wood, roof made of zinc, tile, or fibro cement	Wall and floor made of wood or bamboo, roof made of zinc or palm leaves	Wall and floor made of bamboo, roof made of palm leaves
Occupation of household head	Rice farmer, fish trader, goods trader, video service provider	Rice and crop farmer	Hired laborer
Other things owned	Motor boat, bicycle, video machine, television	Bicycle, television, boat	None

Most often, borrowing is made and paid in-kind, such as when rice is borrowed and paid for with labor service. Collateral is usually not required when villagers borrow from neighbors and relatives because it is done in good faith and trust. In most households, the women usually handle the family purse and take care of family expenditure; borrowing and lending money to others are mutually decided between husband and wife.

Social Capital

Like the other villages in the commune, Ou Chralang is a socially integrated village where trust and goodwill among villagers are the basis for daily community life. Celebrations and social activities celebrated by villages are the same as those in the other villages in the commune (refer to Table 2).

Village Administration

The head person of Ou Chralang is the village chief who is assisted by two group chiefs (Figure 23). The village has a Village Development Committee composed of a chief, a vice chief, a secretary, a chief of the Rice Bank, a chief of the Buffalo Bank, and one member (Figure 24).

Ou Chralang has a Community Fisheries Committee that is headed by the chief and assisted by a vice chief, a cashier, a secretary and one member (Figure 25). The committee is in charge of the management and planning for fisheries and aquatic resources of the village.

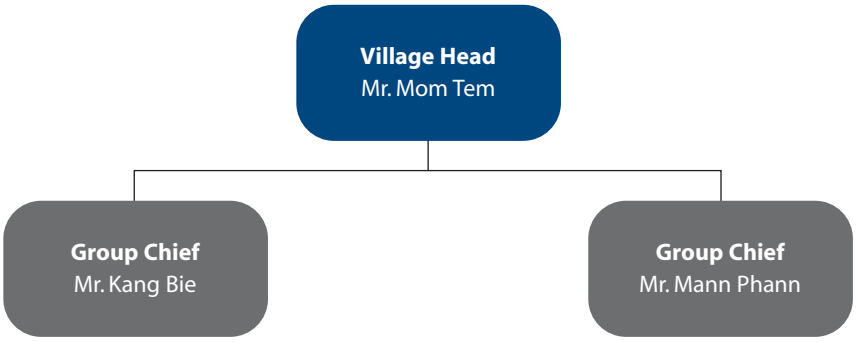

Figure 23: Ou Chralang village organizational chart

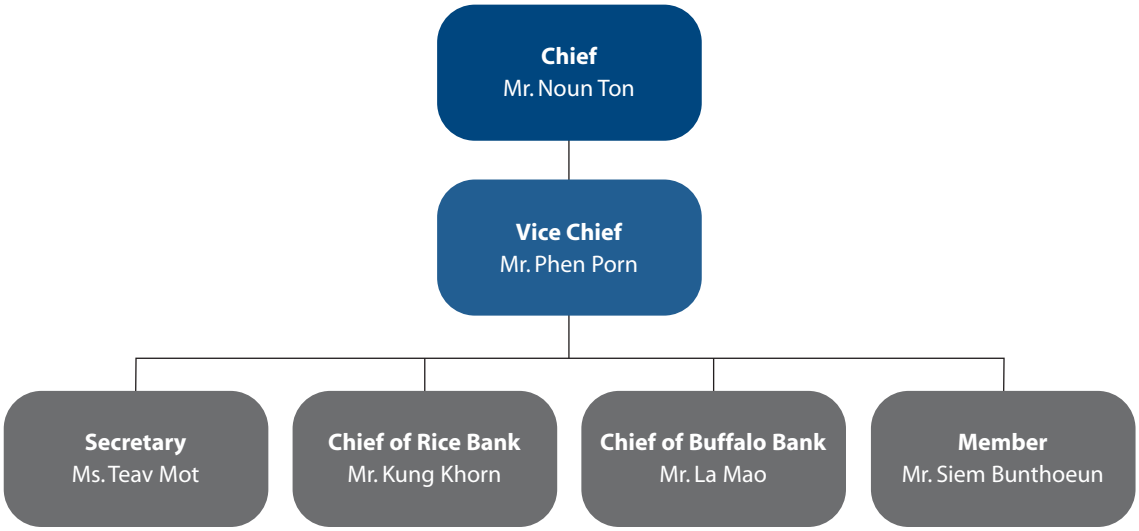

Figure 24: Ou Chralang village development committee chart

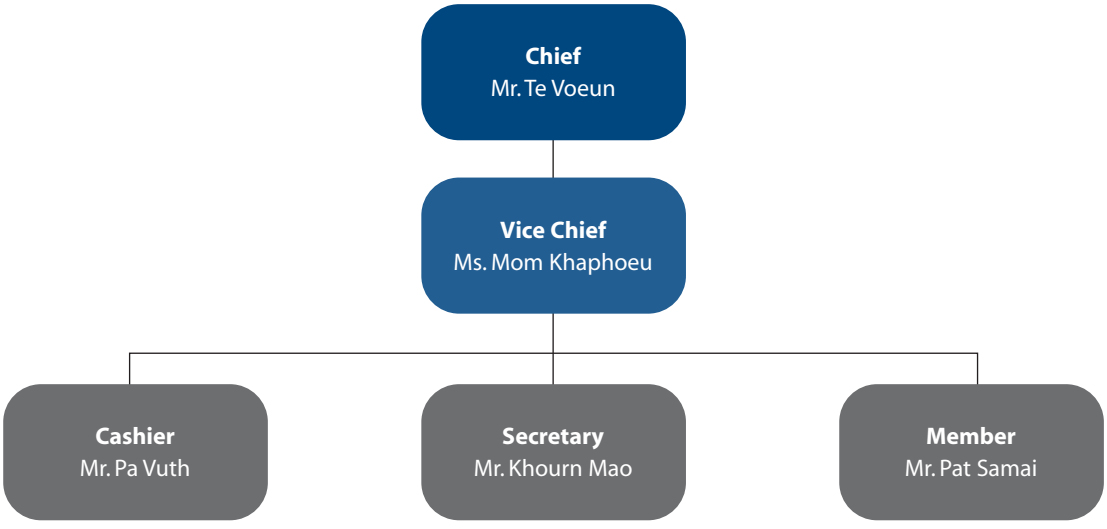

Figure 25: Ou Chralang village community fisheries committee chart






Village Profile

Livelihoods, Vulnerability, Stakeholders and Aquatic Resources Management

Livelihoods in the Villages

Rice farming and fishing are the main livelihoods in the villages of Tboung Kla, Koh Chruem and Ou Chralang. Most heads of the household are involved in farming or fishing as their primary or secondary occupation (Figures 26 and 27).

Other main livelihoods in the village include rearing of animals, growing vegetables and farming other crops. Additional land-based occupations include resin collection, provision of manual labor, selling of goods in stores, and collection of wood for sale. Gathering of aquatic plants and animals, gathering aquatic wood are particularly important aquatic resource activities. Almost all the households undertake the activity to supplement their daily household consumption (Table 5).

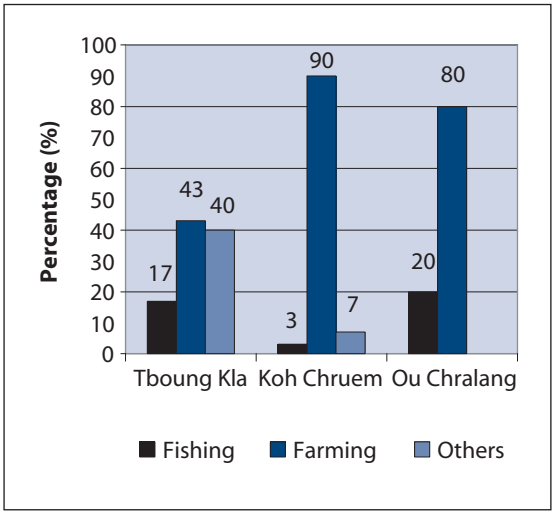

Figure 26: Primary occupation of household heads

Table 5: Aquatic resources-based livelihoods

Livelihoods	Percent of households		
	Tboung Kla	Koh Chruem	Ou Chralang
Fishing	80.0	93.3	100.0
Fish processing	60.0	86.7	90.0
Gathering of aquatic plants and animals	100.0	100.0	100.0

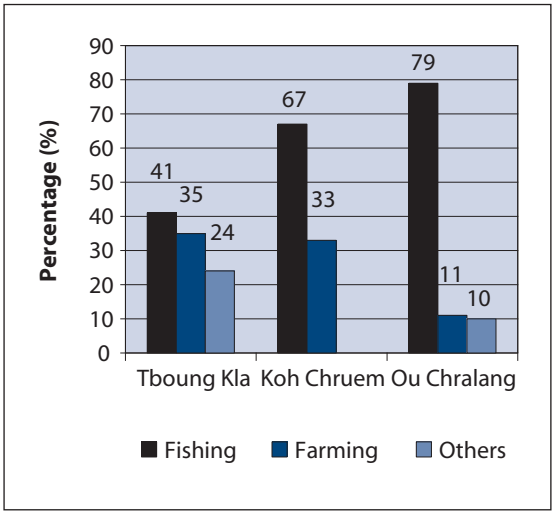

Figure 27: Secondary occupation of household heads

Vulnerability of the Villages

Trends

Population growth in the villages in the Ou Mreah commune followed a similar pattern. In 1975, the number of households increased as in-migration from cities and other population centers into the countryside occurred due to Khmer Rouge policies. In 1980, the population decreased when people migrated back to their former home areas after the Khmer Rouge government collapsed. From the 1980s up to the present, the population increased again as outsiders settled in villages, married and young people built new households.

During the Khmer Rouge regime, aquatic resources in the villages were abundant because little exploitation occurred as people were preoccupied by social conflict. This abundance continued into the 1980s because there were only a few fishers, most being small-scale and using traditional techniques. In the 1990s up to the present, the situation reversed as the number of people and fishers increased. The villagers now believe that fishing areas in their villages are already over-fished and that fish habitats have been damaged.

Forest resources in the villages were also abundant during the Khmer Rouge period as people harvested wood and other forest products only for communal use. In the 1980s, the state of forest resources remained good because the trading of logs was still not yet practiced. In the 1990s a logging firm began operations in the area, this coupled with the illegal cutting of trees by individuals, contributed to the deterioration of forest resources. Presently there is ongoing illegal clearing and cutting of trees; this is perceived by villagers to be supported by powerful people.

Poor health care and nutrition are constant problems in the villages. During the time of the Khmer Rouge, many died due to a lack of food and medicine brought about by civil conflict. Even after this period, food was limited because of poor agricultural production brought about by drought and floods. Health care was also inadequate since doctors seldom visited villages and people did not have enough money to buy medicine when they fell ill.

Some basic health care facilities were provided by NGOs in the 1990s, such as the construction of toilets and water treatment, but these activities have stopped. And villagers believed that the population increase contributed to the worsening situation in their villages; which in turn has resulted in the deterioration of forest and aquatic resources. Furthermore, they believe that poor nutrition and health care directly resulted from the poor economic situation of the village.

Shocks

Droughts and floods are periodic climate-related problems that affect agriculture, food supplies and village economies. In recent years, these twin natural disasters have been alternating in occurrence with serious consequences. In 1996 and 2002, big floods occurred, while in 2003 a serious drought took place. These events greatly influenced agricultural harvests and reduced the food supply and, consequently, lead to the deteriorated health and nutritional condition of villagers. Physically, villagers coped with floods by either moving their houses and animals to higher ground or moving to other villages above the flood zone, however this coping mechanism was not available for their agricultural crops. In the case of droughts, villagers have no means to mitigate its negative impacts because there are no irrigation systems in the villages. Aside from the destruction of crops, droughts and floods also brought diseases and starvation to the livestock, resulting in many animal deaths. There are also inadequate veterinarian facilities to treat sick animals, thus worsening the problem. This leaves villagers with little choice but to pre-empt the problem by killing them for food.

People in the villages considered the occurrence of droughts and floods, and the subsequent arrival of various diseases, as critical negative factors affecting their lives and the overall condition of their village. They believe little can be done to ameliorate them since they are natural phenomena.

Seasonality

The dry season in the villages, and generally throughout Cambodia, is from November to April; the wet season is from May to October. Rice production is rain-fed and planted only in the wet season since the villages have no irrigation systems. Land preparation is carried out during

the early wet season months of June and July, while planting is conducted in the months of July and August. Rice plants grow from August to November and harvesting takes place in November to January depending on the rice variety planted.

Work in the villages is concentrated on rice farming during land preparation, planting and harvesting seasons. The period which rice grows, coincides with the migration of fish. During this period, fishing becomes a major activity. Men are usually involved in land preparation, planting and harvesting; women help in planting and harvesting and play and important role in processing and marketing the harvest. Women, assisted by children, normally plant vegetables all year round in addition to their household chores. Children help in the care of livestock, fowl and other farm animals.

Fishing activities follow the water level in the Mekong River and the migration patterns of fish. During the later dry and early wet season months of May to July, when the water is not yet high, fish start to migrate from deep pools to other water areas, fishing is intense and catch is high. By the wet month of August, fish catch becomes moderate. In the middle and late wet season months of September to November when water level is high, fishing intensity and catch is low. During the early and middle dry season months of December to February, as fish migrate from the Tonle Sap Lake upstream in the Mekong River, fishing intensity and catch becomes high. By the middle dry season months of March and April when the water level is low, catch is again moderate, completing the fishing cycle.

Based on 2003-2004 data collected, average fish catch per household in the villages of Tboung Kla, Koh Chruem and Ou Chralang is higher in the dry season (312 kilograms) than in the wet season (274 kilograms) (Figure 28). On an annual basis, average fish catch per household is roughly 586 kilograms. Like fishing, the gathering of aquatic plants and animals also has seasonal variations. On average in the three villages, more aquatic plants are collected per household in the dry season (32 kilograms) than in the wet season (13 kilograms). The annual average for gathering plants in all households is 45 kilograms. With regards to aquatic animals per household in the three villages, a far greater amount is caught in the dry season (70 kilograms) than in the wet season (16 kilograms). The annual average catch for aquatic animals is 86 kilograms for all households.

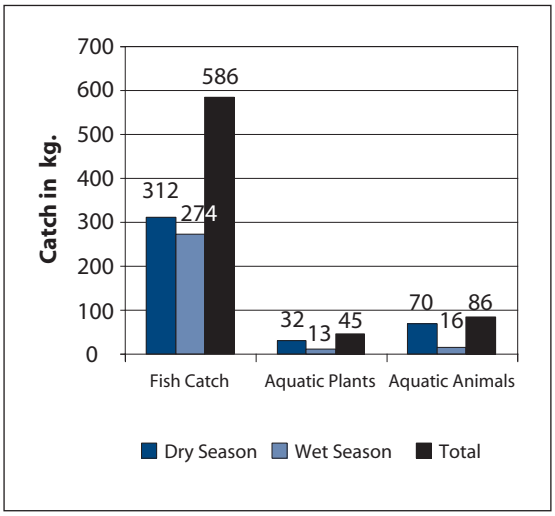

Figure 28: Seasonal and annual fish catch and aquatic plants and animals gathered.

Following the law of supply and demand, the price of rice is high during the planting season when it becomes relatively scarce and low during the harvesting season when it is plentiful. In the months when the supply of rice and fish is moderate, their prices are also moderate. The variability in the availability of rice and fish makes rice hoarding and fish processing useful. Villagers usually process some of the fish catch into dried, salted and other processed forms so that they last into the months when the catch is low.

The availability of work in the village also coincides mainly with rice farming. The demand for farm labor is high during land preparation, planting, and harvesting times, however during the growing season demand is low. Many villagers go fishing when farm work is not available. But some villagers reported that they are unemployed or underemployed when demand for labor is low at certain times of the year.

Villagers tend to think that limited employment during the seasonal slack of economic activities in their village is a major factor affecting their incomes and lives. They believe that creating alternative income opportunities for the people is needed. They also believe that seasonal changes in agricultural and fish prices can be significantly minimized through the development of better marketing and processing systems for their products.

Village Stakeholders

The primary stakeholders in the utilization and development of aquatic resources in the villages of Tboung Kla, Koh Chruem and Ou Chralang are the different households involved in fishing, fish processing and the gathering of different aquatic plants and animals. Secondary stakeholders consist of government agencies and organizations involved in the village and the private entities that are based outside the village that are involved, directly or indirectly, with the exploitation of aquatic resources in the village. Government agencies include national and provincial Department of Fisheries (DoF) units; district, commune and village administrative organizations; and the police and military units. Private entities include NGOs, outside fishers who fish in village waters, fish traders, the sellers of boats, fishing gears, and other fishing materials and money-lenders (Figure 29).

Given their functions related to fisheries and aquatic resources management, the provincial and national DoF units play relevant roles in the management of aquatic resources in the villages. They play an important role in the organization and development of community fisheries committees in the villages. However, they have limited staff and financial resources to effectively exercise their functions and cover the large number of villages across the province.

Local administrative organizations and officials in each district, commune and village also play a key role in the management of fisheries and aquatic resources in the villages. As in the case of national and provincial administrative agencies, however, they are constrained by limited man-power and resources in the discharge of their functions. The community fisheries committees,

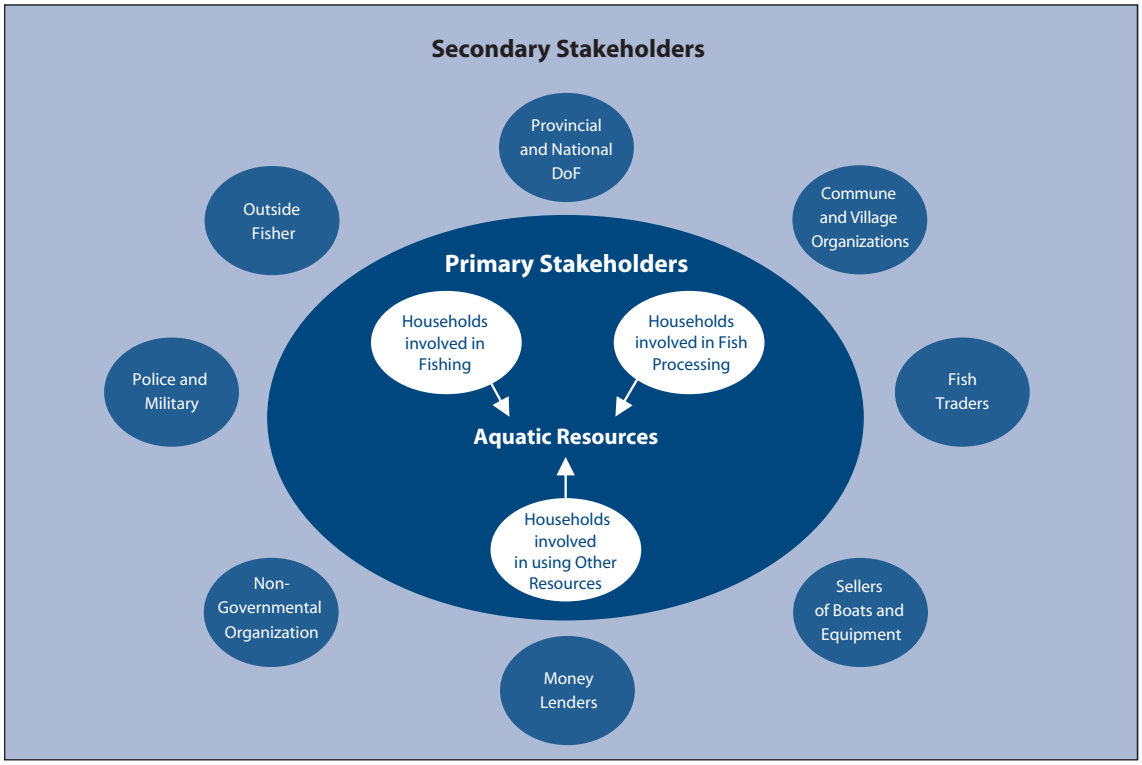

Figure 29: Stakeholders of aquatic resources

in particular, are lacking in resources to effectively perform their functions and for the most part are not fully operational at present.

The contributions of the military and police units in the villages to current aquatic resources management have been unclear since they also have general police duties to attend to. non-governmental organizations have contributed to health care in the village but their scope has not included specific work on aquatic resources management so far.

The NGOs which assisted in the construction of toilets or water treatment systems contributed to the improvement of the health conditions in the villages. Those which assisted in livelihoods such as rice production activities helped provide alternative work to the villagers that may have helped ease fishing pressure on aquatic resources.

Due to the open access nature of fishing areas and the time taken to set up community fisheries boundaries, outside fishers intrude upon village waters. These fishers from other villages reduce the catch of village fishers, increase the total number of fishers, and add to the exploitation of fisheries and aquatic resources. Outsiders may also care less about maintaining aquatic resources for long-term sustainability since they are non-residents and their main interest is to catch as much fish as they can.

Fish traders, who live outside the villages but buy fish there, contribute to the economic welfare of villages. In a helpful manner, they provide an easy and convenient channel for the marketing of fish. However, in the absence of competition, fish traders can control the buying price of fish to the disadvantage of village fishers.

Boat, fishing gear, fishing equipment and material sellers from outside the village also make positive contributions to the economy of the fishing villages. They help to bring in better equipment and new technology that leads to improvements in the total fish catch. Despite these positive aspects for fishers, the assistance of these stakeholders may intensify the exploitation of aquatic resources in the long run.

Money-lenders in the village help by providing fishers with needed capital to purchase equipment for fishing. However, these positive measures can be diminished if interest rates are set too high, making it difficult for poorer fishers to pay their loans. In general, the service provided by money-lenders in terms of capital provision is beneficial for the village, as long as interest rates are kept at reasonable levels.

Aquatic Resources Management

Access Issues

There are several issues related to aquatic resources management that affect the villagers of Tboung Kla, Koh Chruem and Ou Chralang. The critical issues are as follows:

- Illegal fishing practices are prevalent through the use of electrocution devices, small mesh-sized push nets, and the use of explosives.
- Overfishing is common and is caused by the increasing numbers of fishers from within the village as well as those from other villages.
- Fishing boundaries are undefined.
- Villagers have limited knowledge with regards to the law and natural resources management.
- There is poor monitoring and enforcement by the authorities.
- There is a lack of financial resources to purchase more efficient fishing gears.
- The Community Fisheries Committee lacks sufficient funds for aquatic resources management.
- There is a lack of alternative jobs for fishers to wean them away from fishing.
- Disturbance by big motorboats not only causes noise but also riverbank erosion from wave action.

In addition to these issues, other issues which directly affect the access of villagers to aquatic resources include the payment of access fees, the presence of fishing lots, the presence of fish sanctuaries and the imposition of closed seasons (Table 6). A third of the villagers considered fish sanctuaries as an issue. However, more villagers felt that fish sanctuaries increased access (17 percent) rather than reduced access (11 percent) to aquatic resources. The imposition of closed seasons is well recognized by about 80 percent of the villagers. The intent of these closures to allow stocks to recover is understood by many fishers since over 40 percent thought it increased access to fish resources.

Table 6. Aquatic resources related access issues in the villages

Access issues	Percent of households
Presence of fish sanctuaries	
Issue recognized by	33
Effect on households:	
Reduces access	11
Increases access	17
Remains the same	5
No opinion	67
Imposition of closed season	
Issue recognized by	81
Effect on households:	
Reduces access	21
Increases access	41
Remains the same	18
No opinion	19

Illegal fishing

The villagers identified illegal fishing as the most important management issue in the villages. Among the causes of illegal fishing was a lack of understanding among fishers of its effects on aquatic resources. In addition, they were not aware of the laws and regulations put in place to prevent overfishing. Poor economic conditions and the dire need to earn money to support families also contributed to illegal fishing, especially since many fishers are unable to catch enough by legal means. Villagers also mentioned that armed guards provide some illegal fishers protection.

Several effects resulting from illegal fishing were identified by the villagers such as the decrease in fish stocks and conflicts between legal and illegal fishers which could lead to violence in the village and destruction of fish habitats.

Overall these consequences of illegal fishing worsen the poverty level in the villages and make it extremely difficult for the next generation to progress.

Villagers made several suggestions for solutions to thwart illegal fishing and create opportunities to improve current circumstances. These include the following:

- Provide strong monitoring and enforcement efforts.
- Impose effective punishment for illegal fishers.
- Provide effective control of powerful people who support illegal fishers.
- Control the production and selling of illegal fishing gears and other devices.
- Create alternative livelihood opportunities for fishers.
- Strengthen the Community Fisheries Committee.
- Train villagers on fishery rules and regulations.

Village Projects

As part of the project, group discussions among villages were conducted to come up with specific projects to be undertaken at village level. The villages of Tboung Kla, Koh Chruem and Ou Chralang, identified small projects which could be carried out within the communities towards improving aquatic resources management in their respective villages. These projects were intended to: a) create awareness amongst the villagers as well as outsiders on the importance of aquatic resources in their area; and b) encourage the participation and empowerment of communities in the management of aquatic resources.

As an initial project, the villagers chose to construct conservation posts, with funding provided from the Mekong Valuation Project. The main aim of the project was to create and increase awareness on the importance of protecting conservation areas within the village boundaries. These posts were constructed near deep pools within the villages of Tboung Kla, Koh Chruem, Ou Chralang and Ou Mreah. There are many deep pools in this part of the Mekong River in the Stung Treng Province. Some of these deep pools are 60 meters deep. The pools are important as they provide shelther for the brood stock during the dry season and also for spawning during the wet season.

The villagers also proposed the following additional measures for the improvement of overall aquatic resource management in their villages such as:

- Provide for the protection of flooded forests and aquatic resources.
- Control fishing during the spawning season.
- Create alternative employment for fishers such as animal raising and fish growing.
- Train villagers and disseminate information on good natural resources management practices.

Summary of Key Findings

This profile provides a comprehensive background of the three villages of Tboung Kla, Koh Chruem and Ou Chralang in Stung Treng province. On-the-ground findings give substantial insights into the utilization and management of aquatic resources in the villages. The following summarizes the findings.

Socioeconomics

- Villages have limited physical infrastructure or other physical resources. Many roads are partly flooded or are impassable during the wet season; therefore, villagers must rely on transportation by boat.
- Most village households derive their income from occupational sources including rice farming and fishing. Those in dire need borrow money at prohibitive rates of interest from private lenders.
- Most households rely mainly on farming and fishing as either their primary or secondary occupation.
- Many villagers are dependent on other activities related to aquatic resources, such as gathering of aquatic plants and animals to supplement their daily household consumption.

Natural Resources

- The villagers have access to aquatic resources in the Mekong River. Some villages still have forest resources available.
- The villages have land resources for agriculture. Farming is mainly rain-fed rice growing but they grow other crops and raise livestock as well.

Social Aspects

- Health care services are extremely limited in all villages; thus sickness is common and affects the ability of villagers to generate income and obtain food. These circumstances force households to borrow money to pay for medicines and the care of sick family members.
- Most households have no toilets; hence, the river and open fields are used for discharging wastes.
- Many villagers are unable to read and write due to no education or a primary one education at best. Educational services in the villages are limited to primary schools.
- The villagers celebrate various social festivities that promote unity and harmony among community members.

Organizations

- Villages have common administrative organizational structures that tend to management matters of the villages.
- Most villages have established community fisheries committees that are assigned with the function of managing fisheries and aquatic resources.
- Fisheries community committees lack financial and human resources capacity to effectively discharge its functions.

Management and Access Issues

- Management issues related to the use of aquatic resources that affect villagers were identified as illegal fishing using electrocution devices, small mesh-sized push nets, and bombing as being the most important.
- The presence of fish sanctuaries and the imposition of closed fishing seasons are recognized as access-related issues by villagers, the latter more so, but it is generally felt that access to aquatic resources is not constrained.
- For the most part, villagers are aware of overall aquatic resource conditions in their villages and have proposed certain measures to improve managament.

In conclusion, the current trend and initiatives by the Department of Fisheries and local agencies to strengthen the development of community fisheries management in these villages provide an avenue for sustainable development and management of their aquatic resources. The data and information captured from and the discussions held with village communities represent a critical first step to identify and document stakeholder concerns and recommendations. These profiles set the foundation for future research initiatives and development activities towards effective management of aquatic resources and improving the livelihoods of the people in the province.

References

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APPENDIX - I

Additional characteristics of households of Tboung Kla, Koh Chruem and Ou Chralang villages in Ou Mreah Commune, Stung Treng Province (2003-2004)

	Stung Treng	Tboung Kla	Koh Chruem	Ou Chralang
Types of land owned by households (%)				
Residential land	85	100	63	93
Farm land	33	90	0	10
Household ownership of house (%)				
Self- owned	86	80	80	97
Rented	0	0	0	0
Status of house of household (%)				
Permanent	64	53	50	90
Temporary	36	47	50	10
Others	0	0	0	0
Sources of drinking water of households (%)				
River/ lake	99	100	100	97
Rain water	62	30	73	83
Treatment of drinking water by households (%)				
Boiled	77	97	70	63
Filter	24	33	37	3
No treatment	52	33	60	63
Means of disposing waste by household (%)				
River/lake	14	40	3	0
Field	67	50	77	73
Pit	9	10	13	3
Others	19	0	33	23
Source of animal protein of households (%)				
Wet season				
Fish	83	85	77	87
Other aquatic animals	10	7	15	9
Other meat	7	9	8	3
Dry season				
Fish	85	85	82	88
Other aquatic animals	8	4	11	8
Other meat	7	11	6	4
Sources of vegetables of households (%)				
Wet season				
Aquatic vegetables	35	26	79	30
Non-aquatic vegetables	65	74	21	70
Dry season				
Aquatic vegetables	34	33	44	25
Non-aquatic vegetables	66	67	56	75
Source of data: Household survey 2003				
Note : * A household survey was conducted on 30 households per village.				