



STREAM



A livelihoods study of farmers and fishers

in

**Trorbek Pork Village
Kandal Province**

Supported by STREAM Initiative
In cooperation with CFDO and SCALE

August 2002

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Contents

Tables, Figures and Box	ii
Acronyms	iii
Acknowledgements	iv
EXECUTIVE SUMMARY	v
1. INTRODUCTION	1
1.1 Location	1
1.2 History of Trorbek Pork village	1
2. RESULTS	4
2.1 Wealth ranking	4
2.2 Resources	7
2.2.1 Human resources	7
2.2.2 Physical resources	7
2.2.3 Natural resources	7
2.2.4 Social resources	10
2.2.5 Financial resources	13
2.2.6 Summary of village resources	13
2.3 Vulnerabilities	13
2.3.1 Farming and seasonality	13
2.3.2 Trend line	17
2.3.3 Threats	19
2.4 Institutions and processes	20
2.5 Livelihoods strategies	22
2.5.1 Problem ranking	23
2.5.2 Problem tree analysis	24
2.5.3 Action plans	28
2.6 Livelihoods analysis framework	31
3. CONCLUSIONS AND RECOMMENDATIONS	33
3.1 Conclusions	33
3.2 Recommendations	33

Tables, Figures and Box

Table 1	Historical record of events in Trorbek Pork Village	3
Table 2	Wealth ranking criteria for Trorbek Pork villagers	4
Table 3	Main resources available in Trorbek Pork Village	14
Table 4	Institutions related to the livelihoods of Trorbek Pork villagers	21
Table 5	Analysis of institutions in Trorbek Pork Village	21
Table 6	Problem ranking	23
Table 7	Action plan to restore Tagnoun canal	29
Table 8	Action plan to build concrete bridge	30
Table 9	Action plan to create inorganic fertilizer credit	31
Figure 1	Map of Kandal Province	2
Figure 2	Social map of Trorbek Pork Village	6
Figure 3	Land use map of Trorbek Pork Village	8
Figure 4	Topographical transect of Trorbek Pork Village	9
Figure 5	Men's Venn diagram	11
Figure 6	Women's Venn diagram	12
Figure 7	Seasonal calendar of men's activities in Trorbek Pork Village	15
Figure 8	Seasonal calendar of women's activities in Trorbek Pork Village	16
Figure 9	Trends in villagers' livelihoods	19
Figure 10	Problem tree analysis for shallow canal	25
Figure 11	Problem tree analysis for damaged bridge	26
Figure 12	Problem tree analysis for lack of inorganic fertilizer	27
Figure 13	Livelihoods analysis framework	32
Box 1	The story of Trorbek Pork Village	2

Acronyms

ACLEDA	Association of Cambodian Local Economic Development Agencies
CFDO	Community Fisheries Development Office
DoF	Department of Fisheries
FLD	Farmer Livelihood Development
ICS	International Christian Support Fund
IO	International Organization
NGO	Non-governmental Organization
PRA	Participatory Rural Appraisal
SCALE	Cambodian NGO (now FLD)
STREAM	Support to Regional Aquatic Resources Management

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Note: Inconsistencies in English spellings of place names may be attributed to transliteration from Khmer.

EXECUTIVE SUMMARY

This is the report of a livelihoods study team working together with villagers from Trorbek Pork in Kandal Province, Cambodia. The livelihoods study is based on the current population census (1998) and key informant interviews: 10 to 70 villagers (50% women) representing the 140 families of Trorbek Pork Village, Kampong Kong Commune, Koh Thom District, Kandal Province.

In Trorbek Pork, there are 140 families and a total population of 700 persons (378 women). In terms of levels of wealth, the population was classified as: 29% – very poor, 36% – poor, 34% – fair, and less than 1% – fairly rich. The primary occupation of villagers was farming: growing dry season rice on 47 ha, and in addition cultivating vegetables such as corn, mung bean, wax gourd, chilli and sesame on 15 ha. Secondary occupations were fishing, working in a garment factory, singing, laboring and repairing machines. Villagers also earn income from selling rice, fish and firewood.

The main infrastructure and resources available in the village are two rural roads, two bridges (one damaged), 15 wells, three rivers, ten canals and two ponds.

Traditionally people help each other, especially on special occasions such as weddings and village ceremonies. Villagers also exchange labor during the dry rice season. In addition, the people of Trorbek Pork have formed a committee raising money to repair the bridge.

There is a growing concern with the increasing population, the reduction of soil quality due to increased use of inorganic fertilizer, and the fact that the canals have become shallow and villagers are unable to fix them. In addition, this village floods every year, which seriously affects both the village infrastructure and agricultural produce. Lack of communication with outsiders currently constrains access to health care centers, getting a good price for their agricultural produce and getting low interest rates on loans. As a result, more and more villagers are becoming poorer.

Three main institutions have an impact on the livelihoods of the people of Trorbek Pork: government institutions, civil society and business. Due to the increase in rates of poverty, very poor and poor families have no choice but

to borrow money from ACLEDA (Association of Cambodian Local Economic Development Agencies) by mortgaging their land and homesteads, which villagers sometimes lose as they cannot repay the debt.

Families ranked as very poor, poor and fair highlighted 18 issues, of which three issues were prioritized and formed into action plans. The plans include restoring the canals, constructing a bridge across a canal, and creating inorganic fertilizer credit. These three action plans may need intervention from outsiders to make them work.

1. INTRODUCTION

1.1 Location

Kandal is one of the 24 provinces of the Kingdom of Cambodia and surrounds the capital city, Phnom Penh. It has a border on the north with Kampong Cham and Kampong Chhnang Provinces, south with Takeo Province, east with Prey Veng Province and west with Kampong Speu. Kandal Province covers a total area of 3,555.42 km².

Kandal Province consists of 11 districts with total of 147 communes with 1,087 villages. The total population in the province is 1,099,149. The majority of this population are farmers and fishers.

Koh Thom District is one of the 11 districts of Kandal province (Figure 1). It lies between Sa-ang District to the north, Sa-ang district and Takeo Provinces to the west, Vietnam to the south and Leuk Daek District to the east. The district covers a total area of 50,304 ha consisting of 11 communes and 93 villages and has a total population of 140,172, with a women to men ratio of 53:47.

Kampong Kong Commune is bordered by four other communes: Po Ban to the south, Koh Thom and the Bassac river to the west, Chroy Takeo to the south and Leuk Daek to the east.

1.2 History of Trorbek Pork Village

Originally, Trorbek Pork was part of Prek Reusey Village until it was separated into two villages. The old people, aged 70–80 years old, tell the story as in Box 1. The history of the village goes back to the 1970s (Table 1).



Figure 1 Map of Kandal Province

Box 1 The story of Trorbek Pork Village

In the past, Prek Reusey Village had one tree (*Lagerstroemia rigina*, called Trorbek Prey in Khmer, or 'wild guava'). The tree had red-purple flowers and grew on the high ground. The villagers used to strip the bark off that tree for treating disease and they covered the bark of the tree with soil until it became a bump, so the villagers called it Toul Trorbek Pork ('bump tree on the high ground').

Between 1970 and 1971, Prek Reusey Village was under the control of the Khmer Rouge. There were a lot of people there and it was difficult to manage, so Mr Penn, the village chief, secretly proposed to divide this village into two: Trorbek Pork and Prek Reusey Villages.

In 1976, during the Pol Pot regime, Trorbek Pork was officially declared a separate village from Prek Reusey, and the name of village has been Trorbek Pork until now.

Table 1 Historical record of events in Trorbek Pork Village

1971–72	Mr Penn, the village chief, proposed separating Trorbek Pork Village from Prek Reusey Village. There were 52 families who cultivated rice or other crops in collective groups or so-called solidarity groups (<i>Krom Samaky</i>).
1975	There were 71 families. They worked as a group, growing rice, corn and mung bean. In late 1975, the Khmer Rouge ordered 11 families to go and live in Sanda Commune, Leuk Daek District.
1976	Trorbek Pork Village was officially declared a separate village from Prek Reusey Village. There were 62 families living in collective groups.
1979	There were 83 families cultivating dry season rice in <i>Krom Samaky</i> and growing secondary crops by individual families.
1985	There were 85 families. The State of Cambodia gave a land title to each family in the Prek Chhrong Meas, Trorsak Sva, Trapang Reng, Prek Andeng and Kla Lot area. They cultivated rice, red corn and other secondary crops. They also collected firewood, caught fish and made woven mats and bags.
1990	There were 105 families cultivating rice and red corn, collecting firewood, fishing and weaving mats and bags.
1998	There were 112 families. Some villagers abandoned their red corn fields due to drought, the low price of corn and the fact that sometimes the corn or other secondary crops were destroyed as Kampong Kong canal did not have a barrage to prevent flooding from the river.
2002	There were 140 families (August 2002). Most villagers no longer grow corn; instead they cultivate dry season rice. They also fish, collect firewood, weave mats and bags, rear animals and do other work outside the village such as in garment factories.

2. RESULTS

2.1 Wealth ranking

The villagers have a close relationship and they know the standard of living of other families. The livelihoods study team invited 15 older people to rank the wealth of villagers (Table 2). They classified the families of the village into four categories:

Very poor	40 families (29%)
Poor	51 families (36%)
Fair	48 families (34%)
Fairly rich	1 family (<1%)

Figure 2 shows the locations of villagers' dwellings. The type of roof on the dwelling indicates relative wealth: tile roofs are the most costly and leaf roofs the cheapest.

Table 2 Wealth ranking criteria for Trorbek Pork villagers

Items	Very poor	Poor	Fair	Fairly rich
Rice production	500–600 kg/year	1,100 kg/year	1,500–3,000 kg/year	No
Rice field	0–0.15 ha	0.15–0.4 ha	0.4–0.7 ha	No
Secondary crop and homestead	0–0.08 ha	0.08–0.1 ha	0.1–0.15 ha	0.2 ha
Animals	Pig, chicken, duck (1–2 head)	Pig, chicken, cow, duck (1–2 head)	Pig, chicken, cow, duck (1–4 head)	Many cows
Finance	Borrow money and rice from others	Borrow money and rice from others	Borrow money and rice from others	Do not borrow any money
Boat	No	Palm tree boat	Wooden boat	No
Water pumping machine	No	Few families have it	Most families have it	No
TV, cassette player and radio	No	Few families have cassette player and radio	Most of families have cassette player and radio	TV, cassette player and radio
Number of children	4–7	4–7	2–5	

Very poor

The households in this group are vulnerable. Most are headed by widows, old people, and are families who have only a small labor force and many children. They sell their labor to earn money, doing work such as transplanting, clearing flooded forest and grass for dry season rice, and acting as porters. These families have 0–0.08 ha of secondary crop and homestead area and most of them do not have agricultural land or have only a little (0.15 ha is the maximum). Their rice yield is only 500–600 kg per year. This amount is enough for food only for the harvest season and to repay debts. According to the old people in the village, these families previously had dry season rice fields but, due to illness and other shortages in their families, they borrowed money from others. As the interest rates and debts increased, they had to sell land to repay their debts.

Poor

These families are also vulnerable. They commonly have 0.08–0.1 ha of secondary crop and homestead area. They have ducks, chickens, pigs, boats made from palm trees and bicycles. Most of them have 0.15–0.4 ha of agricultural land. Their rice yield is 1,100 kg per year. This amount is enough for only for 3–4 months. In the remaining months, the poor families have to sell their labor to earn a living.

Fair

These families are not as vulnerable as the very poor and poor families. They have 0.1–0.15 ha of secondary crop and homestead area. They have ducks, chickens, pigs, boats made from palm trees, bicycles, motorbikes, water pumping machines and some of the daughters work in garment factories to support their families. Most have 0.15–0.4 ha of agricultural land. Their rice yield is 1,100–3,000 kg per year. This amount is enough to eat for 3–10 months.

Fairly rich

There is one fairly rich family in the village. This family does not have dry season rice land. They have only 0.2 ha of secondary crop and homestead area. They slaughter cows and sell meat and skin in the market in Phnom Penh and in the village.

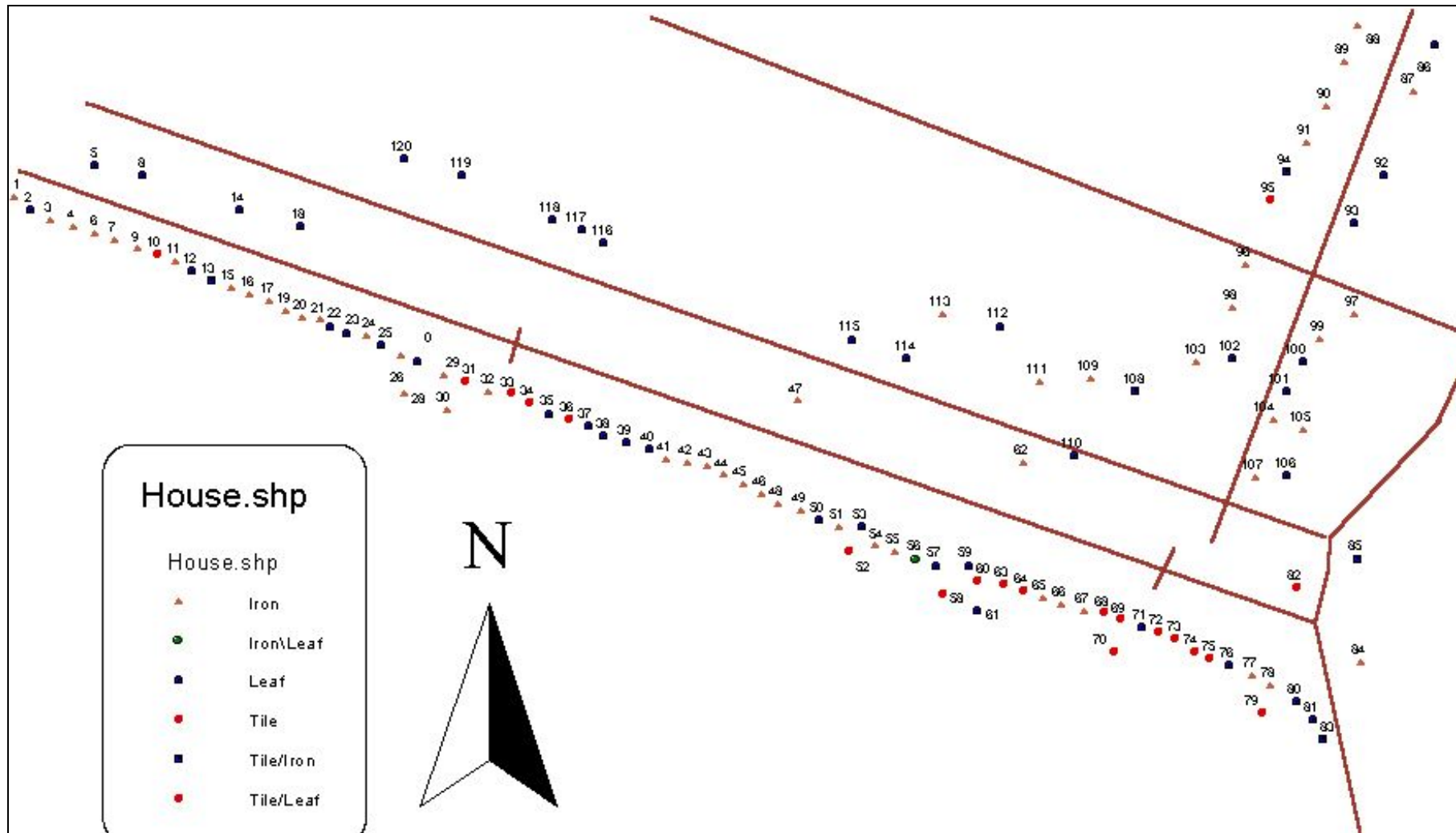


Figure 2 Social map of Trorbek Pork Village

2.2 Resources

2.2.1 Human resources

The majority of villagers are farmers. They cultivate rice, collect firewood, make palm leaf roofs and weave mats. Most of the village floods during the rainy season. The villagers have to transport firewood to the village to use in the dry season. Most of the villagers cannot read or write.

2.2.2 Physical resources

There are two rural roads. One road is 1 km long and used for local travel. The other is used for transporting agricultural produce. There are two bridges, one of which is damaged. To irrigate their rice and other crops, the villagers depend on 10 canals, 15 wells in the rice fields and Troppang Donsrey dam. However, most of the canals have become shallow and do not have enough water to irrigate the rice and crops. In addition, in the dry season, villagers do not have enough clean water to use.

2.2.3 Natural resources

The agricultural land is suitable for dry season rice and secondary crops (see Figures 3 and 4). Currently the villagers grow rice on 47 ha of dry season rice field. There are 7 ha of flooded forest together with three small rivers and three canals, which serve as fish spawning areas. The natural resources have been depleted gradually due to the increase in population.

The villagers also use pesticide, insecticide and inorganic fertilizer intensively which in turn reduces soil quality. Additionally, the village floods every year and sometimes there is a drought. Both of these have an impact on cultivation.

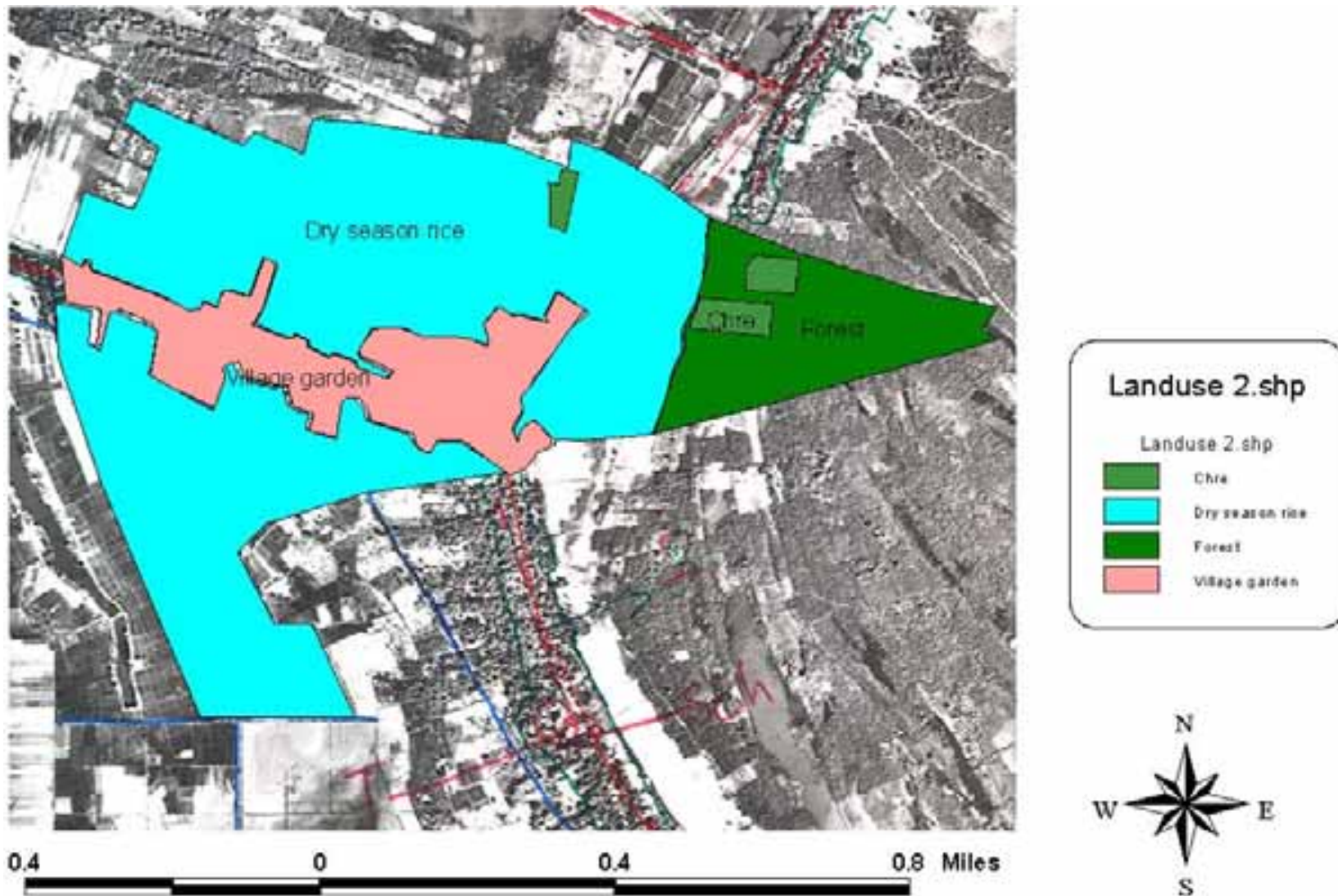


Figure 3 Land use map of Trorbek Pork Village

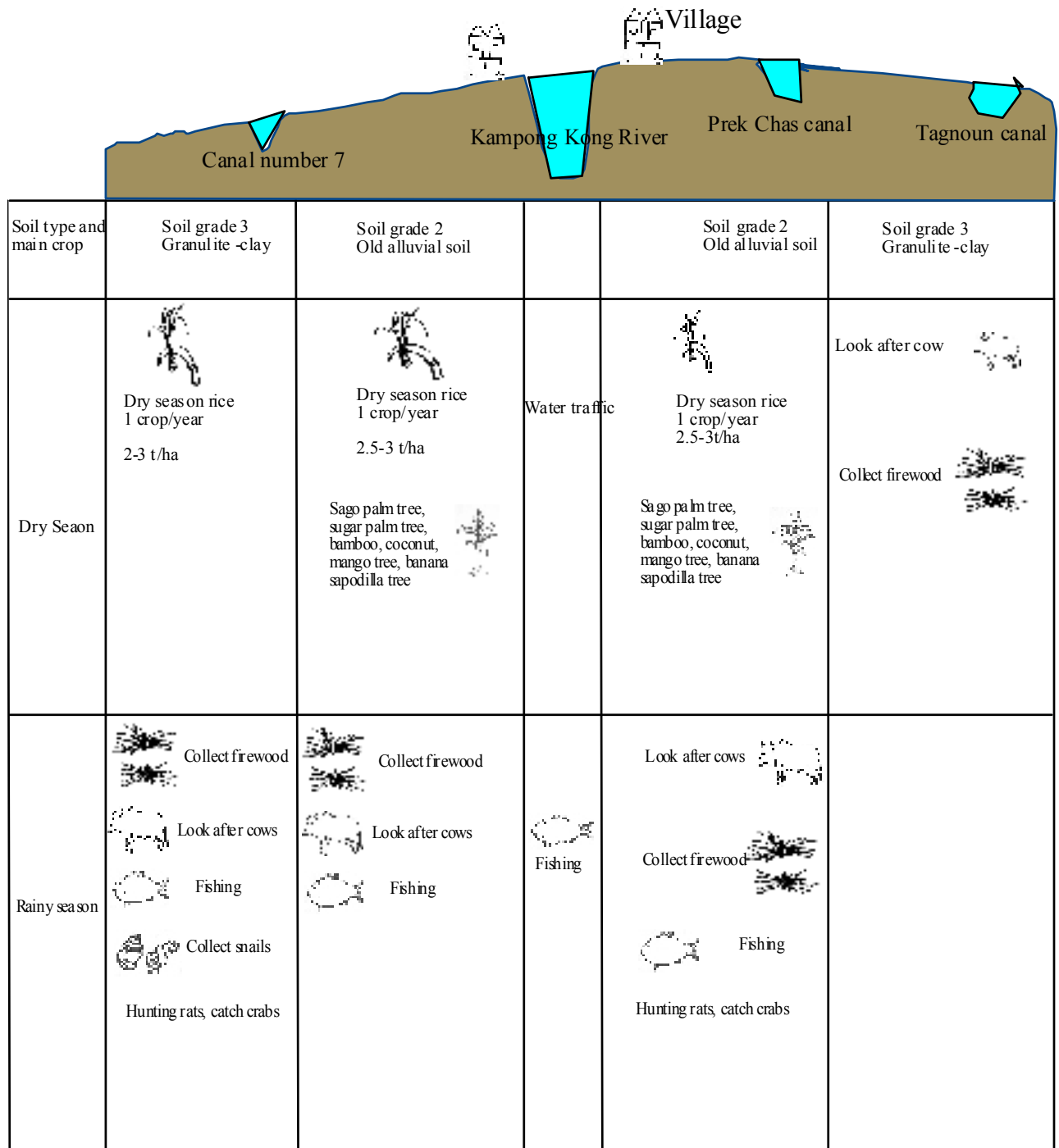


Figure 4 Topographical transect of Trorbek Pork Village

2.2.4 Social resources

Most of the villagers are related and they have good relationships and solidarity among themselves. They help each other on special and important occasions such as house construction, weddings and other ceremonies, and when someone is sick or when someone dies. They also exchange labor, especially during the harvest season. However, those villagers who do not have draft animals have to hire other people to do the ploughing, which costs 12,000 riel¹/morning.) The villagers have also raised some money to repair the bridge.

To learn more about the relationships between the villagers and other people and institutions, the team asked the people of Trobek Pork to complete a Venn diagram. The men and women worked separately to do this. The study team assisted the villagers to make the diagram by using paper circles to represent people and institutions related to the villagers. The size of circle represented the role. The biggest were people that villagers consider to be the most important to their livelihoods and the smaller were less important. The distance from the center of the diagram represents the proximity of the relationship. The closer in proximity to the center, the more familiar the villagers are with the people or institutions.

The two Venn diagrams (Figures 5 and 6) show that in some cases the men and women have similar interests in the same people and institutions such as the Village Chief, the Commune Council, the school, pagoda, International Christian Support Fund (ICS, who provide rice seed credit), businessmen and the market.

¹ The riel is the Cambodian currency unit. There are about 4,000 riel/USD.

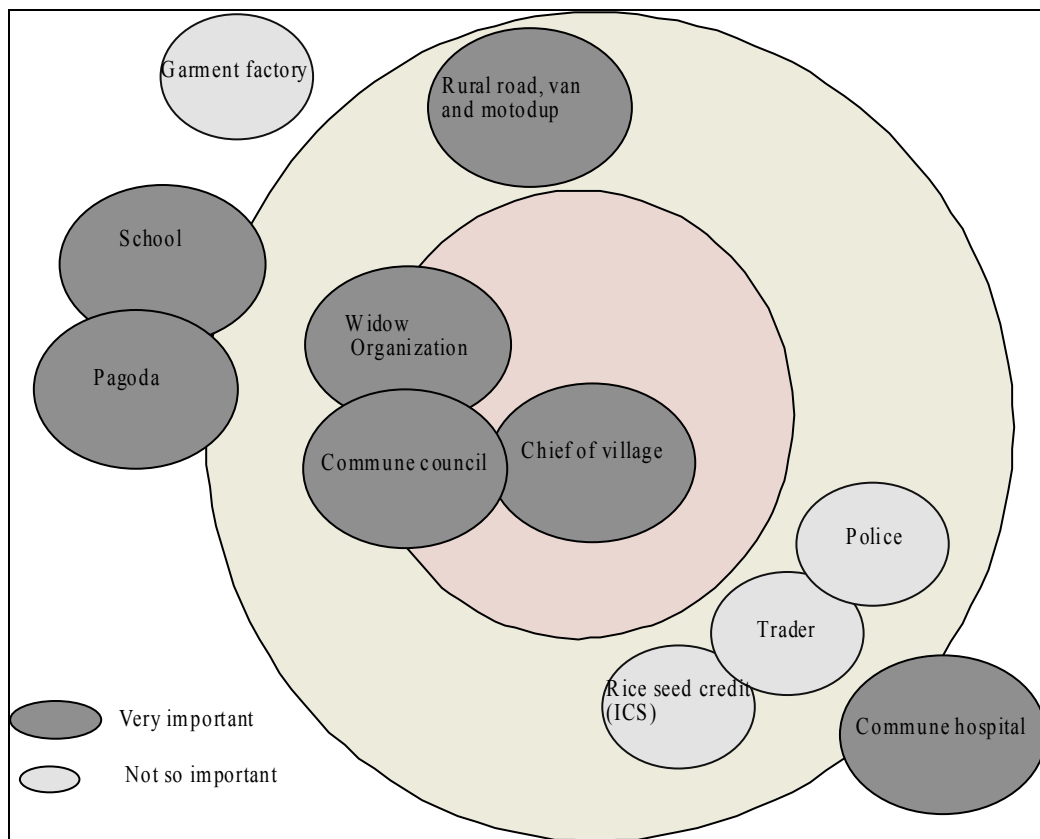


Figure 5 Men's Venn diagram

The Village Chief is the most important person. The Chief helps solve various problems in the village and communicates with outside institutions. The Commune Council safeguards the benefits of villagers and has a fairly close relationship with them. Even though there is no school in the village, it is still considered important for developing human resources in the village. The pagoda is where the villagers pray and in some cases they can borrow its facilities. The ICS and businessmen are considered the second most important institutions. The ICS provides rice seed credit with an appropriate interest rate (20%/year). Villagers also have an interest in the businessmen as they lend money, agricultural facilities and materials as well as buying agricultural produce. However, they demand high interest rates and buy agricultural produce at cheap prices.

There were, however, some differences between the men's and women's groups in relation to some people and institutions such as the Widows' Organization and the hospital. The men thought that the Widows' Organization was important as it provides loans with low interest rates

(5%/month) that are affordable for the villagers. The women, on the other hand, thought it was less important as it only provides credit for short periods and has strict regulations. The men's group thought that the hospital was important as they can get treatment there when they are ill, while the women thought it was not so important as it is a long way from the village. Both men and women thought that the police safeguard their well-being and security. A better road would reduce the cost of traveling to other places.

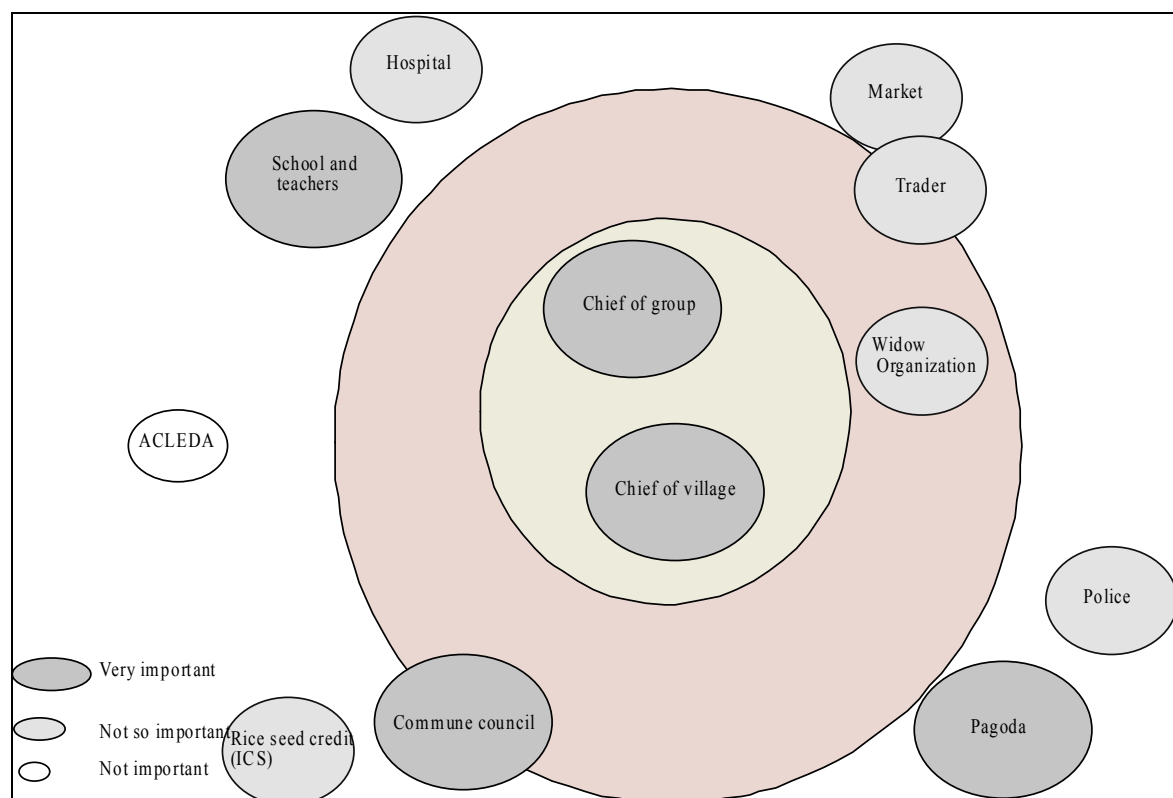


Figure 6 Women's Venn diagram

The men felt that the police, 'motodup' (motorbike taxi) or van, inorganic fertilizer credit and the garment factory were more important, while the women indicated that the group chief and ACLEDA (a credit institution) were more important. Even though the garment factory is located a long way from the village, it provides income to some villagers. The inorganic fertilizer credit is the dream of the villagers as, if it is used, it will reduce the cost of cultivating dry season rice. ACLEDA is not considered so important because it charges high interest rates and only lends for short periods. Moreover,

when repaying the loan, if villagers do not fully follow the contract, they will be fined.

2.2.5 Financial resources

For the 140 families in the village, the main income comes from selling agricultural produce such as rice (38,000 riel/ton), cucumber, corn, mung bean and animals. Some families have daughters who work in garment factories where they can earn US\$ 40/month. Some villagers (men) have to plough for others (12,000 riel/morning) while women transplant and harvest (3,000 riel/day).

Additionally, the very poor families work as porters, and by fishing and collecting firewood during the flood season. This can earn them 3,500 riel/day. Even though they can earn from difference sources as described above, very poor and poor families still face a number of difficulties, which oblige them to borrow money from middlemen outside the village.

2.2.6 Summary of village resources

The main resources of Trorbek Pork village are summarized in Table 3.

2.3 Vulnerabilities

2.3.1 Farming and seasonality

Figures 7 and 8 illustrate seasonal calendars showing farming, social activities and other seasonal changes; these were developed by the men and women separately. Both groups used the lunar calendar. The men's group selected October as the starting point when they begin to cultivate dry season rice, while the women's group selected May when they start to grow secondary crops and November to cultivate dry season rice. The team asked the villagers to score the activities by using candies to represent the amount of work that needed to be done in any given month. The busiest times scored 5 candies, the next busiest 4-3, the least busy 2-1 and periods of no activity were left free.

Table 3 Main resources available in Trorbek Pork Village

Resources	Details
Human	One Village Chief and two deputy Village Chiefs; one member of the pagoda committee; one <i>achar</i> (learned person); one tailor; one bicycle repairman and three machine repairmen; one policeman; ten garment workers; 12 housekeepers; three construction workers; two health care informants; one singer; woven mat and palm leave roof makers; rice mill operators; musicians; fish trap makers
Infrastructure	Two rural roads; 16 canals; two bridges (one damaged); 15 wells in rice fields; 16 wells in the village; one dam; one rice mill; 17 wooden boats; 40 palm trees; boats
Natural	47 ha of dry season rice fields; secondary crop and homestead area; 8 ha of flooded forest; two lakes
Social structure	Oriented toward agricultural production and the service of agricultural materials and facilities such as fertilizer, tractors, and training and extension services; tradition of helping each other; exchanging labor
Income sources	Selling agricultural produce, firewood and fish; working in the garment factory; transplanting and harvesting rice for others (4,000 riel/day); clearing forest for others (5,000 riel/day); making and selling palm leaf roofs and woven mats; working as porters; running a motorbike taxi (<i>motordup</i>)

Dry season rice cultivation is the main activity of villagers. At this time villagers are busy because they are involved in ploughing, harrowing, sowing, transplanting and looking after the rice until it is harvested. The rice has to be transplanted following the receding of the floods or the rice yield will be low or destroyed. The men are involved in this activity more than women. At present, corn cultivation has decreased due to drought, infertile soil and flooding. As with the dry season rice, the men are more involved than the women as the men have to plough, harrow and harvest, and transport the rice to be stored at home.

Month	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT
Dry season rice	☆☆☆ Harrowing, spraying, maintenance			☆☆☆ Harvesting	☆☆	☆☆☆	☆☆☆ Harvesting	☆☆ Ploughing	☆☆	☆		
Grow vegetables	☆☆☆ Growing cucumber and wax gourd			☆☆☆	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆		
Secondary crops			☆☆☆ Growing mung bean	☆☆☆	☆	☆☆ Harvesting	☆☆☆	☆☆	☆	☆☆☆		
Fishing	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆☆	☆☆	☆☆☆	☆☆☆	☆☆☆
Selling labor	☆☆☆ Ploughing and harrowing			☆☆☆ Threshing		☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆☆
Collect firewood						☆☆☆	☆☆☆	☆☆☆	☆☆☆			
Cut sago palm leaves	☆	☆	☆	☆☆☆			☆☆	☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆☆
Collect grass for cows	☆☆☆	☆☆☆	☆☆☆	☆☆	☆☆	☆☆					☆☆☆	☆☆☆
Animal disease	☆☆☆ Cow disease				☆☆☆ Chickens, ducks and pigs							
Ceremonies					☆☆☆	☆☆☆	☆☆☆ Khmer New Year					☆☆☆ Pchum Ben
Weddings		☆☆☆		☆☆		☆☆☆		☆☆☆		☆☆		

Figure 7 Seasonal calendar of men's activities in Trorbek Pork Village

☆ (represents one candy)

Month Activity	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL
Dry season rice	☆☆ Cultivate rice using water from the well			☆☆			Maintenance, harvesting and transplanting ☆☆☆			☆☆ ☆☆	☆☆☆☆ ☆☆	☆☆☆ ☆☆
Secondary crops	☆☆	☆☆	☆☆				☆☆ ☆☆	☆☆ ☆☆	☆☆ ☆☆			
Sell labor (transplant, harvest and clear)	☆	☆	☆		☆☆ ☆☆	☆☆ ☆☆	☆☆ ☆☆	☆	☆	☆	☆	☆
Collect firewood and sell it	☆☆ ☆☆	☆☆ ☆☆	High ground ☆☆ ☆☆									
Weave mats	☆	☆	☆	☆☆ ☆☆	☆☆ ☆☆	☆☆ ☆☆	☆	☆	☆	☆	☆	☆
Feed animals	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Work in the garment factory/housekeeping	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Human illness		☆☆ ☆☆	☆☆ ☆☆				☆☆ Catch cold					
Weddings	☆☆ ☆☆	☆					☆	☆	☆	☆	☆☆ ☆☆ ☆☆	☆
Ceremonies	☆	☆	☆	☆	☆☆ ☆☆ ☆☆	☆	☆	☆	☆	☆	☆☆ ☆☆ ☆☆	☆☆ ☆☆ ☆☆
Animal disease	☆☆ ☆☆	☆☆	☆☆			☆	☆	☆				☆☆ ☆☆
Borrow money	☆	☆	☆	☆	☆	☆	☆☆ ☆☆ ☆☆ Repay in 6 months	☆	☆	☆		

Figure 8 Seasonal calendar of women's activities in Trorbek Pork Village

☆ (represents one candy)

Due to the limited area of agricultural land, villagers (both men and women) have to work for others outside the village: ploughing, transplanting, harvesting, clearing forest and grass, carrying soil, and working as housekeepers and at other jobs. Collecting firewood is also one of the main activities of the villagers, in which both men and women are actively involved. Other work includes cutting and weaving sago palm leaves and mats.

In addition to planting rice and secondary crops, men cut grass while women feed chickens, ducks and pigs. Ten village women work in a garment factory and twelve work as housekeepers in Phnom Penh. Women are more involved in social activities than men, and take part in ceremonies and other traditions in the village. Khmer New Year and *Pchum Ben* (ancestors festival) are considered the two main ceremonies in the village. In addition, villagers typically marry in March and May.

The women's group indicated shortages such as money and rice, and specified the times they usually need to repay money (at the early cultivation and during the flood season.)

2.3.2 Trend line

Little is remembered about the events and changes in the village because of the disruption to villagers during the Pol Pot regime, when villagers were moved to other places and also due to the long duration of the civil war. Ten main events or changes were represented in the diagrams.

Number of families

The old people remembered that in 1960 there were only ten families and in 1975 there were 71. However, in 1976 the number of families decreased. Eleven families were forced by the Khmer Rouge militia to live in Sanda Commune, Leuk Daek District. In 1983 there were 83 families and this number had increased to 140 families in 2002 (Figure 9).

Dry season rice area

The villagers have cultivated dry season rice on the low-lying ground around the village for a long time. Villagers have been clearing the flooded forest area for dry season rice since 1979 and there were 60 ha in 1994. However, in 1995 the dry season rice area decreased to 40 ha because of crop destruction by rats. At present there are 47 ha of dry season rice (Figure 9).

Use of inorganic fertilizer

It is recognized that the use of inorganic fertilizer (urea: 16-20-0) makes the soil hard and infertile, but there is no sign of decreased usage. Villagers claimed that if inorganic fertilizer was not used, rice yield would drop and as a result they would lose out (Figure 9).

Rice yield

The villagers recognize that a good rice yield is associated with five main factors: rice variety, fertilizer, soil, water and pest destruction. Apparently, between 1979-90 there was enough water to irrigate the cultivation of rice on low-lying ground, a local variety of rice was cultivated, inorganic fertilizer was not used and the yield did not fluctuate much. Between 1990-2002 the rice yield has been stable as the use of inorganic fertilizer has been intensified and new varieties of rice have been introduced (Lom-ang Ksach, Srov Arphiwath-504) along with the use of pesticides and insecticides. In 1995, the rice yield decreased drastically due to destruction by rats (Figure 9).

Wells to irrigate crop

The villagers have been drilling wells to irrigate their crops since 1995 because no other irrigation system has been available. The increase in the number of wells drilled, however, may impact on soil quality.

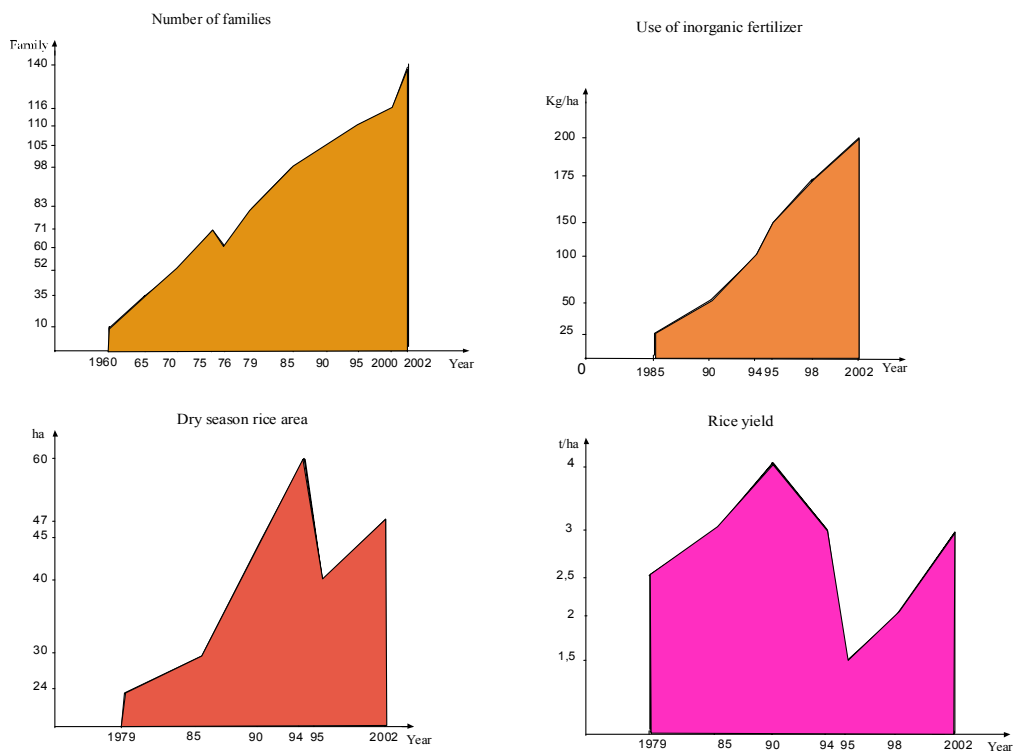


Figure 9 Trends in villagers' livelihoods

Water pumping machine

The villagers have changed their means of agricultural production over time. The use of small water pumping machines has increased since 1993. The introduction of these has led to the expansion of dry season rice fields to some high ground areas. The pumping machines have reduced the amount of labor and time needed, but incur costs such as the outlay for the machine itself, and the cost of gasoline and machine repair.

2.3.3 Threats

Based on the livelihoods study, the team found the following threats which impact on the villagers' livelihoods.

Agricultural land

The amount of agricultural land is not proportionate to the increasing number of people. Moreover, due to rat and pest destruction and lack of water to irrigate, villagers have had to abandon some of the agricultural land. Twenty hectares of agricultural land were abandoned in Klalot and Trorsok Sva area.

Soil quality reduction

Rice yield was low so villagers have had to increase the use of inorganic fertilizer and pesticide.

Water level of river

There is no dam to prevent water from flowing into Kampong Kong canal and this floods early, destroying the crops in the area. When the area on the high ground floods in August or September, the soil quality decreases.

Fish

Although the village has rivers, canals and an area of flooded forest where fish typically spawn, in fact the fish population has decreased drastically and people do not have enough fish to eat. This is due to three main factors. First, the increase in population has increased demand on the natural fish stocks; second, the area of flooded forest where the fish take refuge and spawn, is steadily being cleared for use as dry season rice area; and third, some villagers use illegal fishing gear which depletes the stock unnecessarily.

2.4 Institutions and processes

As shown in the Venn diagrams, and in Table 4, three groups of people and institutions are especially important to the villagers and impact on their daily lives: government, business and civil society. The three groups have different impacts on the livelihoods of villagers (Table 5).

Table 4 Institutions related to the livelihoods of Trorbek Pork villagers

Government	Business	Civil society
Group Chief Village Chief Community health care center Commune Council School Police	Widows' Organization Businessmen Credit provider (ACLEDA)	Pagoda ICS

Table 5 Analysis of institutions in Trorbek Pork Village

Institution		Positive	Neutral	Negative
Government	Group Chief		√	
	Village Chief	√		
	Commune Council	√		
	Police	√		
	School	√		
	Commune health care center	√		
Business	Widows' Organization		√	
	Credit provider (ACLEDA)			√
	Middlemen	√		
	Garment factory owner	√		
	Car owners or <i>motodup</i>	√		
Civil society	Pagoda	√		
	ICS	√		

Government

- The Group Chief passes on all the issues and hardships of group members to the Village Chief.
- The Village Chief helps to solve any problems the villagers face and guides and communicates with outside institutions.
- The Commune Council and the police intervene to help solve problems upon request by villagers. However, they do not visit the village frequently and it takes time to have them solve the problems.
- School is important for villagers. It helps to develop the human resources of the village, but there is no school in the village.

- The commune health care center treats villagers, vaccinates children and assists at births. It is difficult to ask physicians to do home visits.

Business

The Widows' Organization and ACLEDA provide credit to the villagers, although very poor and poor families who do not have a land title registration document cannot borrow money. Additionally, ACLEDA charges high interest rates. Traders who lend money and buy agricultural produce charge high interest rates and buy agricultural produce at low prices. However, villagers still consider traders to have a positive impact on their livelihoods since if there were no traders, villagers would not be able to sell their agricultural produce at all. Even though the work in the garment factory is difficult (poorly paid, long hours, and may affect health), villagers consider that it has a positive impact on their livelihoods. Women are transported in vans or remorques² to the garment factory. However, the villagers recognize the role of business in their livelihoods, in terms of the determination of agricultural prices, interest rates and supply of materials.

Civil society

The villagers consider the pagoda a place for praying and celebrating ceremonies, although there is no pagoda in the village.

ICS provides rice seed credit to villagers and charges low interest rates. ICS also provides some study materials to very poor and poor students in the village.

2.5 Livelihoods strategies

Dry season rice is the main activity of villagers, while collecting firewood, growing secondary crops, fishing, selling labor and weaving mats are secondary activities. The livelihoods study team assisted the villagers to explore, analyze and prioritize issues and to develop an action plan for those which were deemed most important.

² A motorbike with a trailer attached, used for transporting people and goods.

The very poor, poor and fair families were interested in ranking the problems. They face a number of problems: the canals are shallow; the bridge is damaged; there is a lack of food, gasoline, cow credit, inorganic fertilizer credit, pesticide and clean water, and no market where they can sell agricultural produce.

2.5.1 Problem ranking

Sixty-seven villagers (including 28 women) participated in ranking the problems. Each villager was given 20 seeds of corn and the facilitator asked them to rank the problems by putting five seeds next to the most critical problem and fewer seeds if the problem was less important. Table 6 shows the problems that the villagers identified in order of seriousness.

Table 6 Problem ranking

No	Problem	Score	Percentage (%)
1	Canals are shallow	185	13.80
2	Bridge is damaged	173	13.00
3	No inorganic fertilizer credit	154	11.49
4	Lack of food	130	9.70
5	Lack of gasoline	124	9.25
6	Unemployment	106	7.91
7	Lack of rice seed credit	76	5.67
8	No cow credit	75	5.60
9	Lack of support to widows	63	4.70
10	Lack of water pumping machines	52	3.88
11	Lack of pesticides	39	2.91
12	Lack of skills and knowledge	25	1.86
13	No water pumping station	25	1.86
14	Lack of rural roads	25	1.86
15	Lack of credit (cash)	24	1.79
16	Lack of access to good price and market	22	1.64
17	Lack of water sewage	22	1.64
18	Lack of well to provide clean water	20	1.50
Total		1,340	100.00

2.5.2 Problem tree analysis

The three most serious problems – shallow canals, damaged bridge and lack of inorganic fertilizer – were analyzed visually through a problem tree (Figures 10, 11 and 12).

Shallow canals

The cultivation of dry season rice is totally dependent on the irrigation system. Because Trorbek Pork Village floods during the rainy season every year, canals and irrigation systems are shallow due to siltation, sedimentation and erosion.

According to the problem ranking, the shallow canals was the most serious problem. The livelihoods study team analyzed the cause and effect of the problem and discovered that when the canals become shallow, villagers do not have enough water to irrigate their dry season rice, so they have to borrow money to buy water pumping machines and/or drill wells in the rice fields to get water. This costs a lot of money. In addition, getting water from the well reduces soil fertility.

Damaged bridge

Kampong Kong bridge is an important part of the infrastructure which makes it easier for villagers to transport their agricultural produce across Kampong Kong River. At the moment villagers have to hire others to transport their agricultural materials and produce. This is time-consuming since the existing bridge is small and damaged. A new one is needed which is big enough for an ox-cart to cross.

Lack of inorganic fertilizer

To get high rice yield, villagers have to use inorganic fertilizers and the soil fertility is thus reduced. To obtain inorganic fertilizer, villagers have to sell rice, borrow money or get an advance of inorganic fertilizer which involves paying high interest rates.

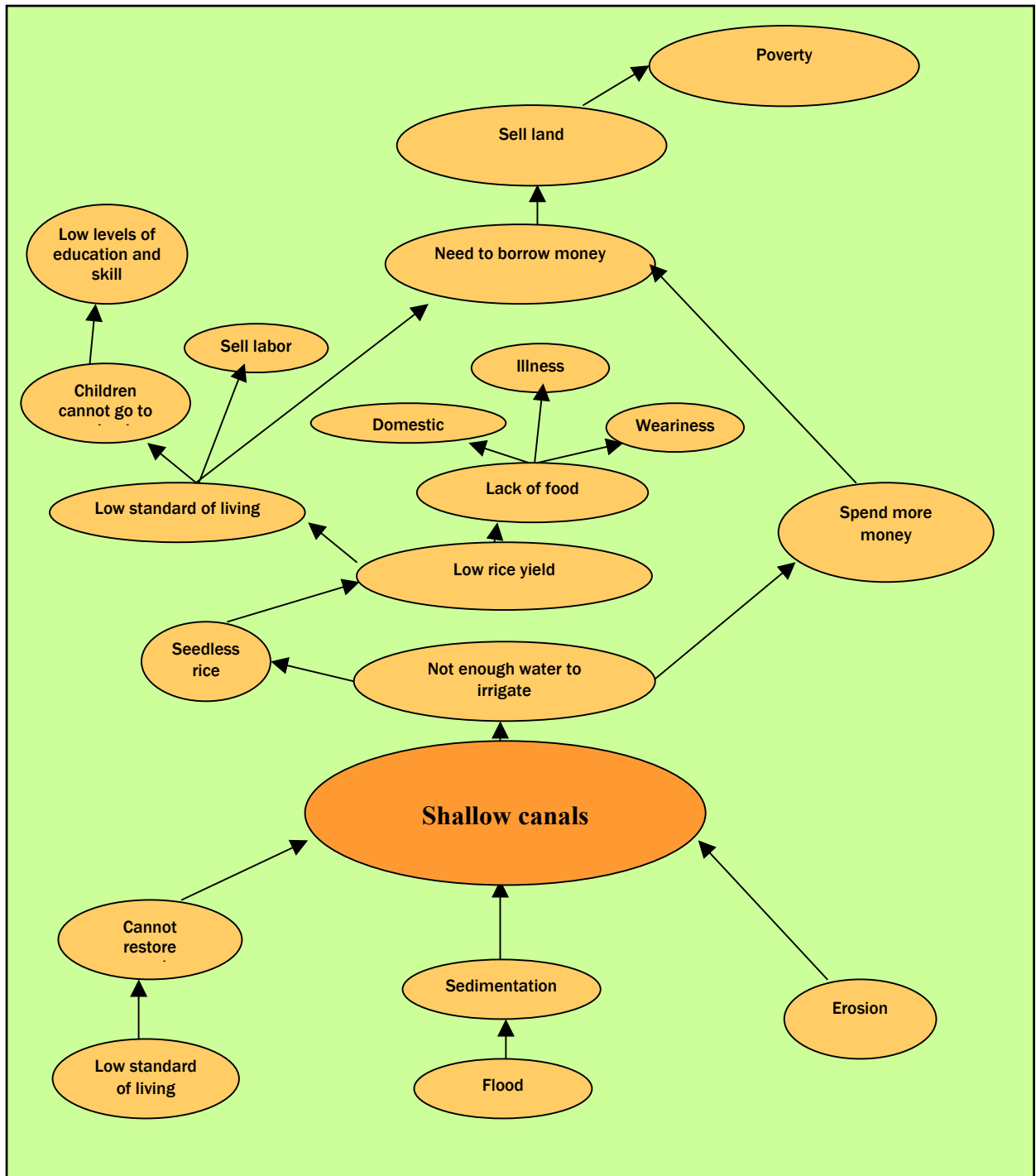


Figure 10 Problem tree analysis for shallow canal

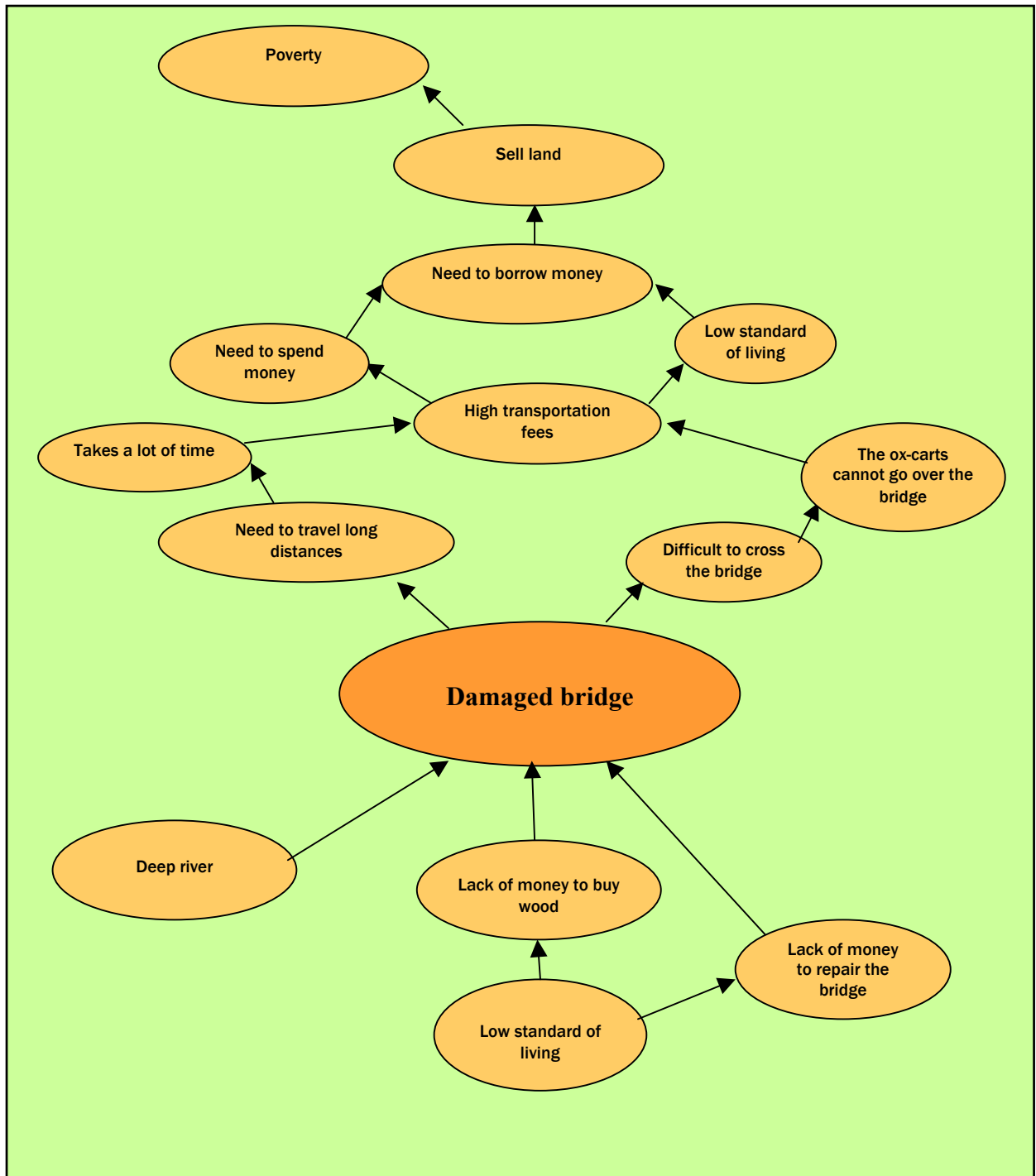


Figure 11 Problem tree analysis for damaged bridge

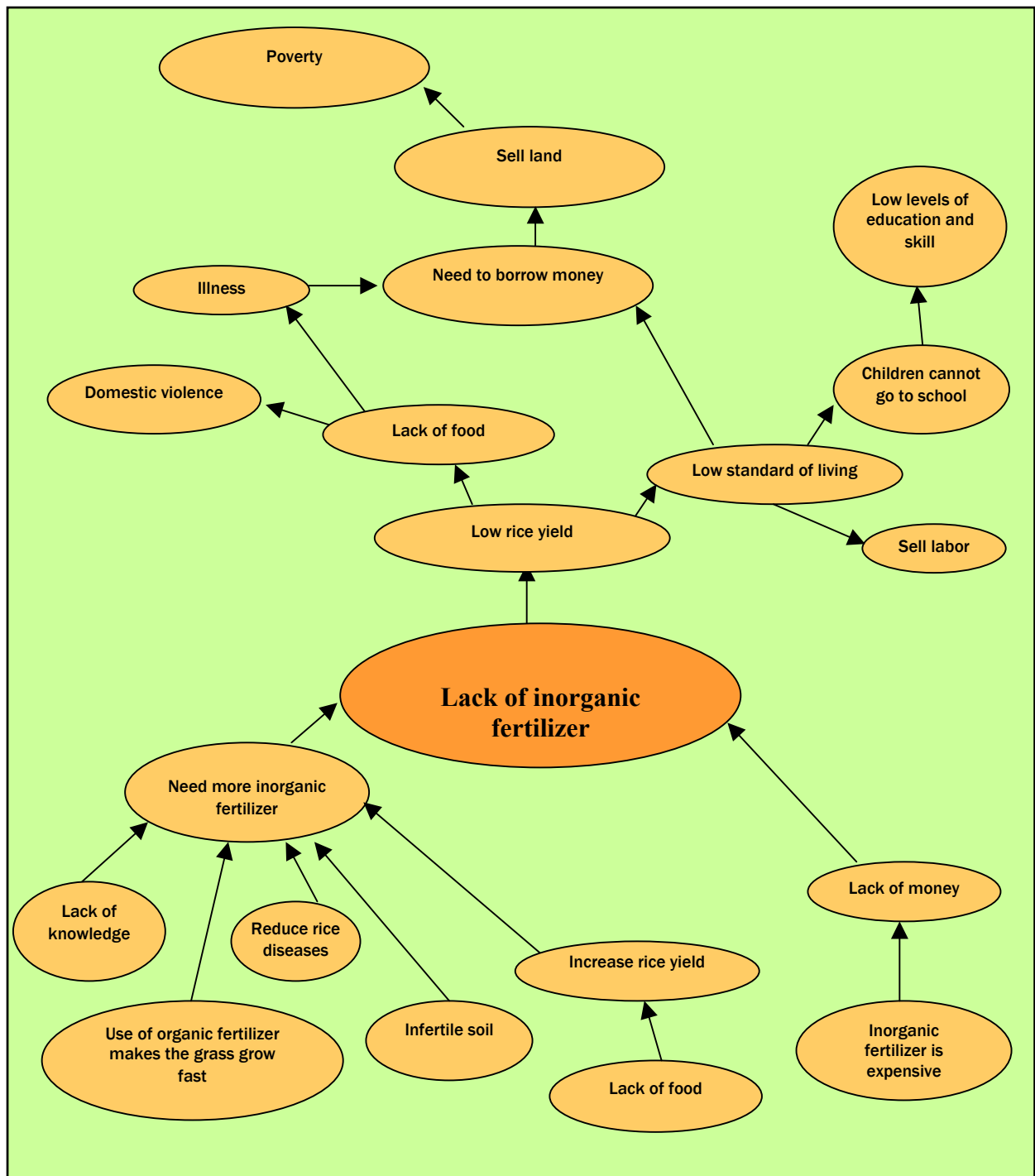


Figure 12 Problem tree analysis for lack of inorganic fertilizer

2.5.3 Action plans

The villagers actively participated in making action plans for the three problems of the shallow canals, damaged bridge and lack of inorganic fertilizer.

Canal restoration

The first one (Table 7) involved the restoration of canals because most of them were shallow and damaged and cannot store enough water to irrigate crops and dry season rice. Villagers realize that if the canals are restored, they will not have to buy water from others and they will get a higher rice yield. There are nine canals in the village: Dey Tarong and Tayon, O Tachhor, Tagnoun, 7 Mett, Number 10, Number 50, Number 30.5, Bambekbal 10 and Daung Kearnthom. Among these canals, Tagnoun was selected for restoration and an action plan was devised. This will be a model action plan for the restoration of other canals in the village.

Concrete bridge building

The construction of a concrete bridge across Kampong Kong River is the second action plan (Table 8) made by the villagers. A concrete bridge will make it easier for them to travel and transport agricultural produce. It is intended that the bridge will be 35m long and 4 m wide.

Inorganic fertilizer credit

The third action plan (Table 9) involved inorganic fertilizer credit. Most villagers use inorganic fertilizer (urea) at a rate of 2–3 bags/ha. Villagers felt that to increase rice yield, they would have to use inorganic fertilizer. Even though they have organic fertilizer in the form of manure, they do not like to fertilize the rice fields with this as it makes the grass grow fast which in turn reduces the rice yield. More than 90% of families participate in this credit scheme.

Table 7 Action plan to restore Tagnoun canal

Activities	Initiate	Participants	Materials	Problems faced	Timeframe
Selection of committee member	Trorbek Pork villagers	Trorbek Pork villagers	Pens and books	Do not want to participate and lack of money	01/04/2003
Develop proposal to restore the canal	Committee	Committee and villagers	Pens and books	Lack of money	05/04/2003
Raising money to buy facilities	Committee	Villagers	Pens and books	Some very poor and poor families do not participate	07/04/2003
Implementation of canal restoration	Committee	Villagers	Shovel, basket and hoe	Lack of money	10/04/2003
Committee will be kept to maintenance canals	Villagers	Villagers	Shovel, basket and hoe and some budget	Lack of money	

Table 8 Action plan to build concrete bridge

Activities	Initiate	Participants	Materials	Problems faced	Timeframe
Selection of committee member	Trorbek Pork villagers	Trorbek Pork villagers	Pens and books	Do not want to participate and lack of money	01/03/2003
Develop proposal	Committee	Committee and villagers	Pens and books	Lack of money Lack of technicians	08/03/2003
Raising money to buy facilities	Committee	Villagers	Pens and books, paper	Some very poor and poor families do not participate	15/03/2003
Implementation	Committee	Villagers and technicians	Steel, cement, gravel, sand and construction facility	Lack of money Lack of technicians Lack of construction material	30/03/2003
Maintenance	Committee	Villagers	Budget and guards	Lack of money	

Table 9 Action plan to create inorganic fertilizer credit

Activities	Initiate	Participants	Materials	Problems faced	Timeframe
Selection of committee member	Villagers	Villagers	Pens and books	Lack of money Difficult to select committee	15/08/2002
Develop proposal and form group	Committee	Villagers	Pens and books		20/08/2002
Register members	Committee and chief of group	Villagers	Pens and books		27/08/2002
Set up regulations	Committee members	Committee members and villagers	Pens and books	Change regulations	30/08/2002
Assess the needs of members	Members	Members	Pens and books	Lack of money	05/09/2002
Communication	Committee	Government organization, generous person, NGOs	Means of transport	Lack of money	10/09/2002

2.6 Livelihoods analysis framework

As a result of the livelihoods study, the team were able to construct a framework showing the outcomes of the livelihoods analysis (Figure 13).

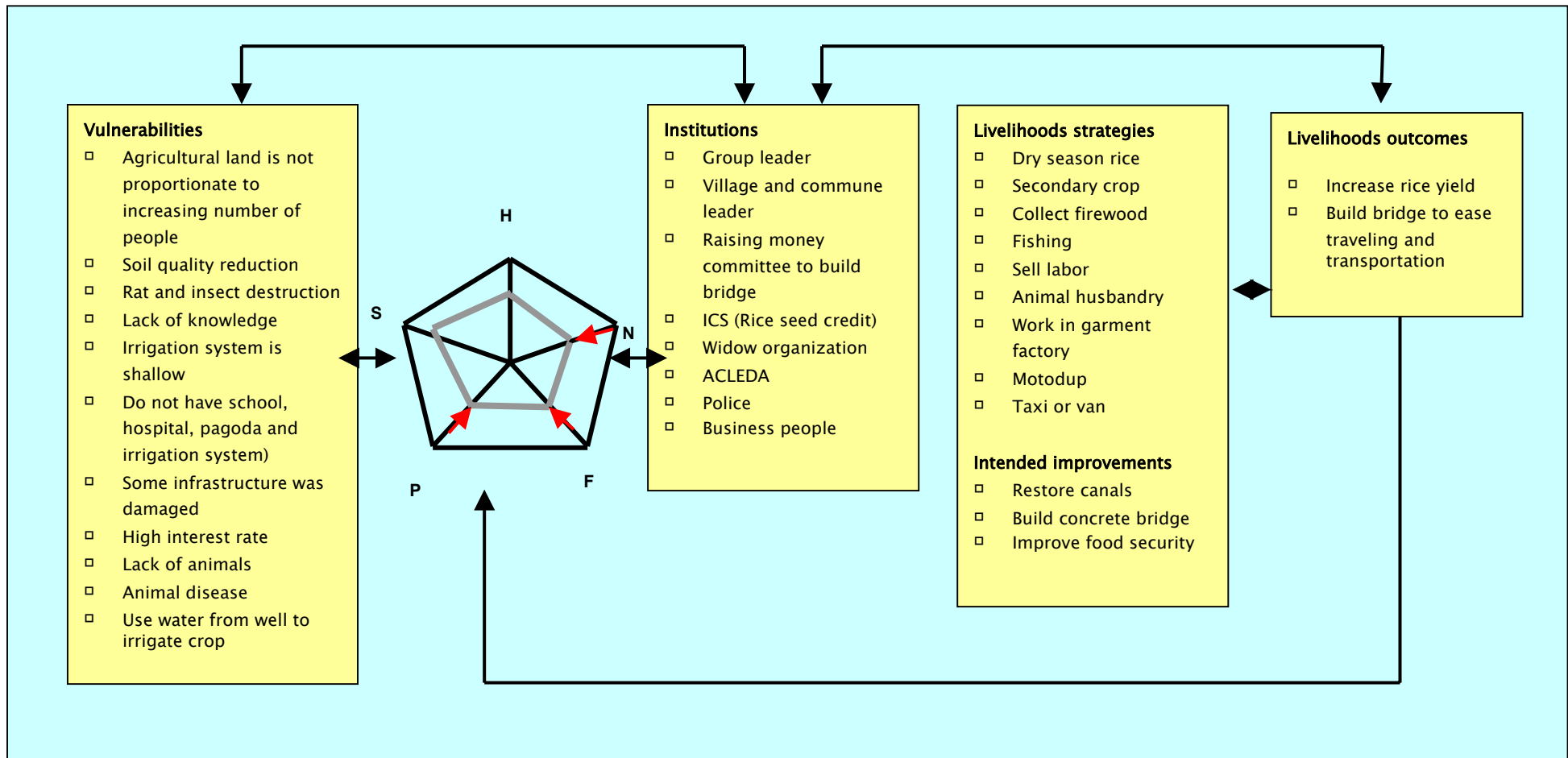


Figure 13 Livelihoods analysis framework

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The majority of Trorbek Pork villagers are farmers who depend on natural resources available in the village. They mainly earn income from selling rice, fish and firewood, and earn wages from working in garment factories and as laborers. The livelihoods study team found that villagers are vulnerable to these factors:

- Some canals in the villagers are damaged and need to be restored.
- The dry season rice area is not proportionate to the increasing number of people.
- The number of very poor and poor families will increase if there is no intervention from outsiders.
- There is no proper technical application of fertilizers and pesticides. As a result, villagers face a number of problems and threats such as soil quality reduction, rice disease, pest destruction, increased use of pesticides and health problems related to their usage.
- The lack of infrastructure, especially a bridge, makes it difficult for villagers to travel and transport their agricultural produce.
- Villagers are charged high interest rates when they borrow money, while their agricultural produce is cheap.
- Villagers still have low levels of skills and knowledge.
- Fish production is decreasing year by year due to illegal fishing.

3.2 Recommendations

- Villagers need support from outsiders to implement their action plans.
- Government institutions, IOs or NGOs should provide credit with low interest rates.
- Related institutions should build the capacity of villagers to manage their resources sustainably.
- There needs to be a crack-down on illegal fishing, especially during the fishing closed season.