

Appendix G Summary of Focus Group Discussions

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Focus Group Discussion 1 - Farmers, Kampong Speu, 28 February 2006

A meeting was held at Angsang Kream Village, Chhung Ruk Commune, Kong Pisey District, Kampong Speu Province with seven farmers - five men and two women - on February 28, 2006.

Village Production

The farmers explained that in their village there are 140 households and that the proportion of households carrying out various agriculture activities was as follows:

- paddy – 90 percent,
- vegetable – 85 percent,
- aquaculture - 0 percent
- other agriculture activities (eg. other crops, livestock, etc) – 0.7 percent
- rice-based non-agricultural activities (eg. milling, trade, processing, storage, transportation) – 2.8 percent
- non-rice-based non-agricultural activities (eg. construction, garment manufacturing) – 0.7 percent.

Of the villagers' total income 24 percent is from paddy, 54 percent from vegetables and 22 percent from other activities.

Seed

The farmers in this village planted three main varieties of rice, namely Neang Sor, Champa Meas and Phka Malis, but most farmers chose Neang Sor due to the nature of the land. Farmers provide their own seed except Neang Malis, which is provided to the farmers by Angkor Rong Reung Company.

The Enfant Development Organization is a French NGO that provides seed to the farmers, but only a few households have received seed from this organization and then only 5kg per families.

Water Control & Irrigation

This village has an irrigation system and water source but it is not enough for farmers to grow two rice harvests a year so they have only one harvest and most farmers grow vegetables after the rice harvest. Around 85 percent grow vegetables such as watermelons, wax gourd and pumpkin, they want to have two annual rice cultivations, but the supply of water is insufficient.

The villagers have formed a water user group to manage the use of water from the irrigation system, which was built by the government, and each family is required to pay 40,000 riel per year for water system maintenance.

Fertilizers & Pesticides

Wet season rice yield is 1.5 to 2.2 tonnes consisting of traditional varieties, Neang Sor, Champa Meas and Phka Malis. The farmers use little Urea and DAP chemical fertilizer (only 100 kg/ha) for increasing the yield of the rice and all farmers used chemical fertilizer to improve soil quality.

However farmers used more chemical fertilizers for vegetables than for rice using 250 kg/ha and also used pesticides. The farmers showed us some of the pesticides they had bought from the market, but all of them had already expired a year ago.

Capital & Credit

The villagers have formed a fertilizer community credit, whereby the community provides fertilizer to the farmers, who pay the credit back at harvest time at an acceptable interest rate.

The village has several credit institutions such as ACLEDA Bank, Vision Fund, and Amreth credit but they charge a high interest rate of around four percent per month.

Land preparation & Post-harvest Operations

Most of villagers are poor existing on a low income and cultivating the land by animals (cows and buffalos), not one has either a tractor or threshing machine. The villagers harvest the rice and vegetables and thresh the rice by hand.

The villagers have met some problems with post-harvest management through moisture, rats and insects and sometimes they store seed that does not grow well and is impure.

Marketing

The village has made great progress over the past four years by moving from a situation of considerable poverty to a situation of limited poverty. Nevertheless, the challenge of moving one further step by introducing high value-added activities in agricultural and non-agricultural activities (local industry and services) does not seem to be well understood.

The villagers complained about the market for their paddy and vegetables because sometimes there is no market for their vegetables or the price is low and the villagers cannot get enough information about the price.

They requested an NGO or PDA (Provincial Department of Agriculture) to help form a market group for selling their products and that such a group could find a market for the villagers easier than individuals.

Infrastructure & Extension Services

The village has no electricity nor sanitary water supply and bad infrastructure. There is also no school, health facilities, any agricultural expertise or vet in the village.

There are some government projects such as irrigation rehabilitation, a CEDAK project promoting farmers to grow one-seedling rice, and PDA has an extension skills' project on vegetable growing system and rice storage management.

Constraints & Opportunities

The villagers' main constraints are:

- Irrigation system – there is insufficient water
- Lack of market information
- Lack of good quality seed
- Natural environment - effect of drought and floods on farmers).

The investment needed by villagers to increase value-added is a cow or Rota till power, pumps and an irrigation system.

There is an opportunity to increase value-added in rice-based farming through the rehabilitation of the master irrigation system because this village already has a master

irrigation system with two canals and two sub-canals for distributing water to the rice field, and the farmers are willing to work hard.

Focus Group Discussion 2 - Farmers, Kampong Speu, 28 February 2006

A group discussion meeting was held with seven farmers (five women and two men) at Kaheng village, Kaheng commune, Samrong Torng district, Kampong Speu province on February 28, 2006.

Village Production

All the farmers cultivate wet and dry season paddy, growing vegetables and other crops. There are 94 households in the village, of which 15 percent are very poor farmers, 40 percent are poor farmers and 45 percent are not poor. The average area of land devoted to rice cultivation is about 0.50 hectares and 0.05 hectares for vegetables per family. Even if they have only a small plot of land for rice, farmers still use many rice varieties, typically two to three per family.

The proportion of households involved in various activities and the proportion of income coming from those activities is shown in the table below:

| Activities | Proportion of households in village | Proportion of total income in the village |
|-----------------|-------------------------------------|---|
| Paddy | 100 | 40 |
| Vegetables | 100 | 30 |
| Mung bean | 19 | 3 |
| Aquaculture | 19 | 3 |
| Livestock | 90 | 10 |
| Milling | 8 | 4 |
| Garment factory | 10 | 10 |
| Total | 346 | 100 |

Seed

Farmers use five rice varieties - Neang Menh, Kong Keo, Thpor Daung, Chhma Changkom and IR66. All households use Neang Menh and IR66 varieties, 56.4 percent use Thpor Daung, 28 percent use Chhma Changkom and 3.7 percent use Kong Keo. All farmers use a transplanting method, 92 percent keep rice seeds for their own use and eight percent exchange seeds among fellow farmers.

For vegetable seeds such as pumpkin, cucumber and tomato all farmers keep their own seeds, but for convolvulus, lettuce, Chinese kale and radish, all farmers buy them from the trading shop.

The quality of rice and vegetable seeds is acceptable.

Fertilizers & Pesticides

The farmers buy fertilizers and pesticides from the trading shop in the village, sometimes paying in cash, and sometimes on credit. Many types of fertilizers and pesticides are used. They include DAP, urea, 15-15-15, Folidol, Superman, etc.

The price of fertilizers varies from 70,000 to 85,000 riel per 50 kg, whereas the price of pesticides is from 4,000 to 5,000 riel per bottle. The average quantity of fertilizer applied by the farmers is about 50-60 kg/ha for rice and vegetables. All farmers use cattle manure for both rice and vegetables.

All households use chemical fertilizers, 50 to 60 percent of households use pesticides and 40 to 50 percent use non-chemical pesticides only, while 31 percent of households use IPM (farmers were trained in using this technology under a CEDAC and IPM program). Sometimes, when using IPM, the quality of vegetable products is not good and they could not be sold at the market. Therefore, the farmers use these vegetables as fodder for pigs or for making compost.

The seed rate applied by farmers for wet and dry season rice is about 50 kg per hectare. The quality of agricultural inputs including rice seeds, fertilizers and pesticides was acceptable for the farmers. But sometimes the quality of vegetable seeds bought from the market was not good because of the very low germination rates (possibly due to passing the expiry date).

In year 2005, the average yields of different varieties were:

- Neang Menh: 3 tonnes/ha
- Kong Keo: 3 tonnes/ha
- Thpor Daung: 3 tonnes/ha
- Chhma Changkom: 3 tonnes/ha
- IR66: 3.5 tonnes/ha.

Land Preparation

Land is normally prepared either by using animals, Rotary tiller or human labor:

- Plowing: twice, 79 percent by animals and 21 percent by Rota tiller;
- Harrowing: twice, always by animals;
- Leveling: once especially before transplanting, always by animals;
- Harvesting: all farmers harvested wet season rice, dry season rice and vegetables by hand.
- Threshing: always by machines for dry season rice (IR66) and by hand for wet season rice. After threshing, the farmers collect the rice straw and transport to households for cattle fodder.

Water Control & Irrigation

There is one irrigation canal extending through the village paddy fields. A water user group has been established. The only natural river near the village is Prek Thnot.

The farmers use three types of irrigation: gravity and pumps are used to irrigate the paddy fields, and the vegetable crops are watered by hand. Even with a water user group, canal and water resources, the villagers still have problems with a shortage of water to irrigate the crops during a drought because the irrigation canal is shallow, so the water cannot flow through to the areas to be irrigated and the water user group is not functioning well. The irrigation system needs to be rehabilitated.

All farmers irrigate their rice fields by gravity (about 80 percent of cultivated land), 44.7 percent use motor pumps (about 11 percent of cultivated land), and all farmers irrigate their vegetable crops manually (about nine percent of cultivated land).

Post-harvest Operations

After threshing and cleaning, the farmers store their paddy in the granary, jars, containers and bags. Sixty percent of paddy is sold at the farm gate, 30 percent in the village market and 10 percent to outlets outside the village. In general, the farmers have a good relationship with the traders (although sometimes they have a small problem with the price of paddy, but it is negotiable).

In the village, there are eight small individual mills (8.5 percent of households), which mill the paddy for personal consumption only. The recovery rate of mills in the village varies from 60 to 62 percent. When the farmers bring their paddy to the millers, they need to pay 800 riel/10kg of milled rice if they get the bran back from the miller, otherwise it is free milling if the miller keeps the bran.

Capital, Credit & Extension Services

There are three credit institutions working in the village and 21 percent of farmers receive loans from them, at 3.5 percent interest per month. The average length of a loan is one year. Individual farmers can get a maximum loan of one million riel and a minimum of 500,000 riel, and a group of farmers can get up to 2.5 million riel, but both must put land, cattle and fields as collateral, otherwise they will be rejected. If the farmers fail to pay the loan back on time, they need to secure money from other sources at a very high interest rate (10 percent per month).

In the past, many farmers gained technical knowledge from various training schemes provided by NGOs such as IPM, CEDAC, PUAC and FAMEX Fertilizer Company. About 90 percent of extension services were provided by NGOs and 10 percent from private sources, none was provided by public agencies.

Transportation & Infrastructure

The transportation infrastructure in the village is acceptable, but still needs improvement because a portion of the access road to the market is in a very bad condition and the bridge is very old (part of it is broken). Two percent of households have motorized transport.

There is no electricity in the village and half the households use batteries, and the other half use oil lamps.

Forty-two-and-a-half percent of households have access to clean water (there are only two wells in the village).

Farmer Organizations

In the village, there are four types of farmer organizations - a water user group (WUG), credit group, vegetable group and village savings group. The WUG is not functioning well,

as the water distribution is not well managed, but the other three groups are progressing well, especially the village savings group.

Constraints & Opportunities

The most important constraints are:

- Water: a lack of water means that they cannot grow dry season rice and in addition the existing canals are shallow.
- Difficult access road to market and very old bridge.
- Lack of market.

Investment needed:

- Construction and rehabilitation of irrigation system.
- Road rehabilitation and construction of new bridge.

Focus Group Discussion 3 - Millers, Svay Rieng, 3 March 2006.

Meeting at Ta Troek Village, Kampong Trach Commune, Romeas Hek District, Svay Rieng Province on March 3, 2006.

The meeting was conducted at a milling company with four rice-milling entrepreneurs - Mr. Thy, Mr. Heng, Ms. Hem Yut and Ms. Loek Vanna.

The entrepreneurs explained that in the commune there are currently six commercial rice millers but two of them will close down next year because of annual decreases in production. The problems are the lack of a market for milled rice, as the local market is small and there is a lot of competition.

Buying & Selling

Rice mill processing has decreased because the trade paddy is more profitable. They are buying paddy from farmers, wholesalers or paddy collectors then sell it to Vietnam.

They only supply to the local market and Svay Rieng market. Local farmers grow rice twice a year, but in the dry season less is produced than in the wet season each year, so each rice miller can buy 300-500 tonnes of paddy but about 80 percent of the paddy is sold to Vietnam, and the remaining 20 percent is bought. Most rice millers consider selling rice on the local market because they don't want to sell paddy to Vietnam, which results in a loss in value because the milling is done in Vietnam and the value added from bran, broken rice and husk is used for animal feed in Vietnam rather than Cambodia.

Labour, Capital & Credit

The rice mill in Romeas Hek district employs between two to twelve workers permanently and from three to 20 workers temporarily, most of the work is unskilled.

Most rice millers have limited capital and so need credit to expand their working capital and upgrade equipment. However the rice millers said they were afraid to get credit from credit institutions because the interest rate of between 17 to 48 percent p.a. is high.

Transportation & Infrastructure

Most of the rice millers complained about bad infrastructure for transportation and the high cost of fuel. Some of them have their own trucks and some of them hire a truck.

Competition

There is greater competition among the millers and with paddy collectors. During the harvest most rice millers buy paddy from farmers and paddy collectors at a competitive price and also milled rice is sold at a competitive price.

Constraints

The constraints the rice millers face are:

- Lack of working capital to expand their business and upgrade milling equipment;
- Purchase of low quality paddy with high moisture content from farmers and wholesalers;
- Farmers produce mixed variety, low quality paddy;
- Production costs are high due to the high price of fuel;
- Limited market for milled rice, which they supply only to local market and Svay Rieng;

- Market for paddy is reliant upon the Vietnamese market;
- No support from Government to find market for milled rice and to facilitate export of rice;
- Corruption and illegal payment is still an obstacle;
- Using old mill equipment, which leads to more broken rice;
- Lack of knowledge on storage management, which leads to a high percentage loss of paddy during storage because of high moisture content, rats, birds and yellow kernel.

Focus Group Discussion 4 - Farmers, Svay Rieng, 3 March 2006

A group discussion meeting was held with seven farmers – three women and four men - at Chup Pring village, Thmey commune, Kampong Ro district, Svay Rieng province on March 3, 2006.

Village Production

All the farmers grow dry season rice (twice a year). The first crop is planted in October and harvested at the end of January or early February next year and the second crop is planted in April and harvested in July. There are 314 households living in the village of which 6.4 percent are very poor farmers, 47.8 percent poor farmers and 45.8 percent non-poor farmers.

In addition to rice production, the farmers also grow vegetables and are involved in livestock production, and aquaculture. The proportion of households occupied in various activities and the family income derived from them are described below.

| Activities | Proportion of households in village | Proportion of total income in the village |
|-------------|-------------------------------------|---|
| Paddy | 100 | 70 |
| Vegetable | 20 | 5 |
| Aquaculture | 90 | 12 |
| Livestock | 90 | 12 |
| Milling | 2.5 | 1 |
| Total | 302.5 | 100 |

Seed

Farmers in this village use two rice varieties: VND (90 percent of households) and 504 (10 percent) varieties. These two varieties are purchased from Vietnamese traders, and the seed rate applied by farmers is about 200 kg/ha. The seed price was 1000 riel/kg, and after harvesting the paddy, farmers reserve part of the paddy for using as seed for the following year. All farmers use the broadcasting method.

The quality of paddy seeds bought from Vietnamese traders was acceptable to all the farmers. In 2005, the average yield of paddy of both varieties was five tonnes per hectare.

Land Preparation

Most activities involved in paddy production are mechanized, as follows:

- Land preparation: 80 percent by tractors, 10 percent by Rota tiller, and 10 percent by cattle.
- Harvesting: 90 percent by machines, and 10 percent harvested by hand because the rice stems are lodged.
- Threshing: 100 percent by machines.

After threshing and cleaning, generally farmers do not take the rice straw back home. They tend to leave the rice straw in the fields and take a small quantity for cattle fodder.

Transportation & Repairs

There are no repair shops in the village, so small repairs are carried out by the farmers themselves and larger repairs are sent to Vietnamese shops. They transport equipment and other materials mainly by boat, because the village is flooded every year, most households have boats for transportation and fishing. Most machines and equipment are bought from Vietnam.

Fertilizers & Pesticides

Other agricultural inputs including fertilizers and chemicals (insecticides and herbicides) were also purchased from Vietnam and the quantity used by farmers was quite high (Average: 400kg of fertilizers per hectare, six liters of insecticides per hectare, 200g of herbicide per hectare).

Many types of fertilizer and chemical were used, including DAP, Urea, 20-20-15, Padan, Motoc and Xeout. All chemicals are labeled in Vietnamese and in general, the quality is very good. Not one household is using only non-chemical fertilizer and nor are they using IPM, although many of them have learned how to use this technology. They reported that when they stop using chemicals, the yields are not so good it is difficult to sell the products, especially vegetables.

Water Control & Irrigation

The village is fully irrigated. The irrigation system has been rehabilitated and constructed under the PRASAC project, funded by the EU. After the completion of PRASAC, the water user group and DoWRAM were responsible for operation and maintenance of the irrigation system. All farmers use a motor pump to irrigate their fields. The cost of gasoline is about 2,300 riel per liter, and it comes mostly from Vietnam.

The growers still have problems with water almost every year, because the existing canals are shallow, and the group has not enough funds for repair and maintenance. Nowadays, all farmers are members of the water user group, but they only pay about half of the total money requested by the community for water fees.

Marketing, Post-harvest activities & Processing

After threshing and cleaning, the paddy is packed in PVC bags and kept in the rice fields and sold directly to Vietnamese traders at the farm gates. In general, the farmers have good relationships with traders, but sometimes they have a small problem over the price of paddy, but it is negotiable.

Paddy, for consumption and seeds, is transported to homes and stored in the granary near the households. During storage, the farmers have a small loss due to rats and decreased Moisture content (about two percent).

In the village, there are some small individual milling machines (village mills). These mill paddy for consumption only, but not all farmers are willing to mill here. Many farmers mill in Vietnam, because the recovery rates are higher than small milling machines and they can sell the bran there at a high price (about 500 riel/kg), but the Cambodian farmers lose the husk, which can be used as fuel for cooking rice and other things. The recovery rate of milling machines in the village varies from 55 to 60 percent.

Credit & Capital

Currently the farmers are unwilling to collect loans from the MFI or banks, because the interest rate of four percent is too high, and the administrative arrangements are

complicated requiring that farmers put land title, houses, cattle or other material and equipment down as collateral. In 1997-1998, about 30 percent of producers secured loans from ACLEDA, but many of them sold land and cattle to pay the money back to the bank, as in these years rice yields were very low.

Extension Services & Farmer Organizations

In the past, many farmers received training from public agencies (90 percent), NGOs (six percent), and the private sector (four percent). Therefore they applied the technology learned, and found that some was not applicable. Besides, the farmers still need to learn more especially on techniques to do with insect, pest and water management.

There are two types of farmer organization; the water user group and rice production community. Farmers also want to have a marketing group in their village, so that group representatives can help provide them with information to do with prices and marketing issues.

Constraints

The main constraints related to the paddy production in the village are:

- Water – the canals are too shallow, preventing water from reaching the fields. The farmers will contribute as much labor and money as possible to solve this problem.
- Lack of local markets - the government should help to establish this.
- Flood during wet season (natural issue).

The most important risk they identified was government policy relating to the border issue with Vietnam.

In the future, the farmers are willing to invest in a drying machine, because they have a major problem with the paddy collected in July, due to heavy rain and they think that such a machine would help a lot of villagers.

Focus Group Discussion 5 - Farmers, Svay Rieng, 4 March 2006

A meeting was held in Mr Sovan's house with six farm entrepreneurs (four men and two women), in Khrouch Village, Krolkor Commune, Svay Chhrum District, Svay Rieng Province on March 4, 2006.

Village Production

The farmers explained that there are 408 households in the village, 98 percent of households are involved in paddy growing, 10 percent in vegetable growing, 20 percent in aquaculture, and 97 percent in other agriculture activities, such as other crops and livestock. Two-and-a half percent of households are involved in rice-based non-agricultural activities, such as milling, trading, processing, storage and transportation, while 70 percent are involved in non-rice based non-agricultural activities such as construction or working in garment factories.

Half of the total income of villagers is from paddy; vegetables make up five percent; aquaculture another five percent and other agriculture activities 20 percent; rice-based non-agricultural activities is 10 percent and non-rice based non-agricultural activities is 10 percent.

Water Control & Irrigation

There is no irrigation system and water source, the farmers grow rice only once a year during the wet season with a low yield of only between 1.5 to 2.2 tonnes.

The villagers do not have clear plans for the next five years, their only idea is to rehabilitate the existing (4m x 6m x 5 km) rehabilitation canal and seek a pump but they are willing to make a small contribution of four percent of total investment to this.

Seed, Fertilizers & Pesticides

They use several traditional varieties, such as Tong Chhouk, Krasang Teap, Smer and Sok Sau varieties. Farmers use little Urea and DAP chemical fertilizer, only 100-150Kg per hectare to increase rice yield.

Vegetables are grown for family consumption and supplied to small local markets only, during the discussion, the farmers produced pesticides bought from the market but all of them had expired one year ago.

Land Preparation & Farmer Organizations

Most villagers are poor, living on a low income and the land is tilled by animals, such as cows and buffaloes, no one uses a tractor or a mechanized thresher.

Supported by a CRS (Catholic Relief Services) project, villagers have formed five farmer groups in seven households to improve knowledge of agricultural activities and integrated farming systems and natural environment improvement. Also an IPM project has just trained villagers in post harvest management.

The village has made great progress over the past five years by moving from a situation of considerable poverty to a situation of limited poverty. Nevertheless, the challenge of going one further step in introducing high value-added activities in agricultural and non-agricultural activities (local industry and services) does not seem to be well understood.

Credit & Infrastructure

The village has several credit institutions but the interest rate of around 3.5 percent per month is high.

There is one secondary school but no health facilities, and no fishing expert to disseminate aquaculture technology. There is no water sanitation system and most of villagers they use a tube well.

Constraints

The constraints facing the village are as follows:

- Lack of seed quality
- Lack of irrigation system.
- Low quality chemical fertilizer supplied by local market.

Focus Group Discussion 6 - Farmers, Battambang, 14 March 2006.

A group discussion meeting was held with twenty-four farmers – seven women and 17 men - at Chong Samnay village, Chrey commune, Mong Russey district, Battambang province on March 14, 2006.

Village Production

All of them are producers of early wet and wet season rice (two crops per year) and some have three crops (two rice crops and one vegetable). The early wet season rice crop is planted at the end of April and harvested at the end of July, whereas the second rice crop is planted in August and harvested at the end of December or early January.

There are 357 households living in this village, composed of 35 percent very poor farmers, 37 percent poor farmers and 28 percent non-poor farmers. The village was established in 1983. Rice fields cover 455 hectares of land with another 45 hectares used to grow vegetables and for housing. The wet season average yield is about two tonnes per hectare and early wet season is about three tonnes per hectare.

Besides rice and vegetable production, the farmers are involved in livestock and aquaculture, which was started only in 2006 and therefore no figures are available on the income derived from this activity. The proportion of households occupied in various activities and the family income derived from them are described below.

| Activities | Proportion households in village | Proportion of total income in the village |
|--|---|--|
| Paddy | 93 | 70 |
| Vegetable | 8.4 | 10 |
| Aquaculture | 1.4 | N/A |
| Livestock | 94.4 | 15 |
| Milling | 0.3 | - |
| Non agricultural activities (casino, garment, labor) | 14.0 | 5 |
| Total | 211.5 | 100 |

Seed

Farmers use CAR4, CAR6, CAR8, Raing Chey, Kamping Puoy, Sen Pidor, Rumpe, TN16 and Phka Malis varieties of rice. Most of these varieties are delivered by the provincial Department of Agriculture. Two-hundred-and-eighty households use CAR4, 150 households CAR6, 100 households TN16, 50 households Kamping Puoy, 50 households Rumpe, 30 households Sen Pidor, 10 households Raing Chey, five households CAR8 and two households Phka Malis. Each household uses two to three varieties each year. Practically none (0.3 percent) of the households sold the rice.

All the farmers used the transplanting method for wet season production and the broadcasting technique for early wet season production. Ninety-five percent of the farmers kept the rice seeds for their own use and five percent exchanged seeds among fellow farmers in the village.

Fertilizers & Pesticides

The farmers bought fertilizers and pesticides from Mong Russey market in cash. Many types of fertilizers and pesticides were used, including DAP, Urea, 16-20-00, crab pesticide (rice), potrin (insecticide for vegetable), 2.4D (herbicide) etc.

The price of fertilizers varies from 68,000 to 87,000 riels per 50kg bag. The average quantity of fertilizer applied by the farmers is about 100 kg/ha for rice and 666 kg/ha for vegetables and the average quantity of pesticides used by farmers for both crops is about 0.5 liter/ha. The quality of rice seeds, fertilizers and pesticides was acceptable to the farmers.

Almost all of households (96 percent) use chemical fertilizers and pesticides (95 percent) and only 3.4 percent of households use non-chemical pesticides and non-chemical fertilizers. The same proportion of households use IPM for rice production only, as 25 households were trained in using IPM technology on an IPM-DANIDA program. All farmers who grow vegetables use chemical fertilizers and chemical pesticides. They said that when they did not use chemicals the quality of the vegetables was not good and they could not sell them on the market.

Land Preparation, Water Preparation & Irrigation

Eighty-four percent of farmers used mechanized Rotary tillers to prepare the land and the remaining 16 percent used animals. When using the Rotary tillers farmers would make one plough followed by a harrow and one level, and when using animals, two ploughs followed by one harrow and one leveling.

There is one irrigation canal extending through the rice fields of the village. A water user group has been established. The main source of water supply is the natural river, Mong Russey. The farmers use three types of irrigation: 85/80 percent use pumps, about 10/15 percent use gravity and five percent use manual labor.

The villagers have problems with a lack of water to irrigate their crops during the drought because the irrigation canal is shallow, which means the water cannot flow through to cover all the irrigated areas.

The irrigation system needs to be rehabilitated and the estimated cost is about three million riel. To raise the money, the chief of the community organized a contribution from the village farmers, but only collected about one million riel. As the total money collected was insufficient for the cost of the canal rehabilitation, the money collected was returned to the farmers. Water supply therefore remains the primary constraint for the development of rice-based farming system in the village.

Harvesting, Processing & Post-harvest

Harvesting is totally carried out by hand, but threshing is 100 percent mechanical. After harvesting and cleaning, the farmers store their paddy in the granary and in bags.

Some farmers store their paddy at millers' warehouses for a few months under a verbal agreement that they will sell their paddy to the millers at a two percent discount. The three reasons for this are to keep the paddy for a few months until the price rises, because the farmers have insufficient space for storage, and the price of paddies at harvest time is too low. They estimate that loss during storage is about two percent.

There is one small mill in the village, which is used by only 0.28 percent of households to mill paddy for consumption. The recovery rate is about 60 percent.

Marketing

September and October are the best months to sell paddy, when the price is highest. Eighty percent of paddy is sold to middlemen from outside the village and 20 percent to middleman from within the village. Therefore, all paddy is sold at the farmers' gate.

In general, the farmers have a good relationship with middle-traders, however sometimes they have a small problem because the traders do not come to collect the paddy even though both parties have agreed to it.

The farmers do not have a marketing group. Although they would like such a group, they lack the knowledge competent people to form.

Credit & Capital

There is one farmer credit community, Chong Samnay Community, working in the village, and 42 households (11.8 percent of total) received loans in 2005. This credit community was not opened up for all villagers because of a limit in available capital, which is shared by community members in a revolving fund. The total capital available is 9.8 million riel.

The community fund provides loans to community members only, varying from 200,000 to 300,000 riel at two percent interest. The average length of a loan is between three to five months. The farmers do not need to put assets down as collateral.

Transportation & Infrastructure

The transportation infrastructure in the village is acceptable, but still needs improvement because part of the access road to the village is still in a bad condition. Twenty-four percent of households have motorized transport, 18 Rota tillers and 68 motorbikes. Forty-two percent of households have access to electricity, which costs 2,500 riel/KW, and 58 percent use batteries and oil lamps.

No households have access to clean water, and the drilling of a tube-well is not possible because ground water is too scarce, so the villagers use water from ponds.

Farmer Organizations & Extension Services

There are two types of farmer organizations: an organic community supported by IPM-DANIDA and Chong Samnay Community, which provides credit.

Extension services have been provided to 11.8 percent of households, all from the public sector and PDA).

Previous Projects & Programs

In the past, three programs worked in the village. They were:

- ADESS: which was a good project because it provided technical knowledge to farmers.
- IPM: which was also an effective program for the first three years, because the farmers got a higher yield than their neighbors, but from the fourth year on the yield decreased because the fertility of the soil was depleted.
- SRI-CEDAC: only two households applied this technology. The farmers said that it was a good project because when they applied the technology, rice crop gives more tillers with strong growth.

Constraints

Most important constraints for the development of rice-based farming system are:

- Water: due to lack of water, farmers in the village cannot grow dry season rice and crop diversification and intensification is difficult to implement. In addition, the existing canals are shallow and need rehabilitation. The community plans to invest in this, but can only raise one million riel (US\$250) out of the estimated cost of US\$15,000.
- The price of fertilizers is very high and the paddy price is too low.
- Sometimes, water sources are insufficient because the Mong Russey River is dry.
- The cost of fuel is very high, which causes high production cost.
- There is a lack of repair shops in the village.
- There is also a lack of knowledge on processing agricultural products.

Focus Group Discussion 7 - Farmers, Kampong Thom, 13 March 2006

A meeting was held in Boeung Choeung Village, Boeung Commune, Baray District, Kampong Thom Province with ten farmers, six men and four women, on March 13, 2006.

Village Production

There are 376 households in the village, which is located about 10km from district market, 2km from national road and the group estimated that 20 percent of households are very poor, 60 percent are poor and 20 percent are non-poor.

Rice is the main crop in this village responsible for 70 percent of the overall income, followed by vegetables at 20 percent. Almost every household also raises animals, but the income from this activity is low compared to rice and vegetable.

There are 14 village mills, one noodle processor, one soybean processor and three trucks in the village. Normally one to three members of each household goes to work in a garment factory and some are construction workers or motorbike taxi drivers.

Seed

The farmers use different seed varieties such as Neang Moan, CAR6, Chang Vay Pdao and Phkar Malis. Most of the households use these varieties, except Phkar Malis, which is less used by the farmers. The yield varies from 1.9 tonnes to 2.5 tonnes per hectare.

The villagers grow rice in the wet season only. After harvesting the rice, they grow vegetables. No household produces seed for sale, most seeds are exchanged from family to family, except CAR6, which was introduced by the Department of Agriculture.

Previous Projects & Programs

There was an agriculture project supported by ADRA that focused on health, credit, nutrition, agriculture and rural roads. The farmers accepted the project, because it improved their health, including vaccinating children against six diseases. The farmers also had access to credit and ADRA staff do regular follow-ups.

A second project was a Stung Chinit project supported by GRET/CEDAC that focused on savings and soil improvement. The farmers were able to access credit at a low interest rate. An IPM project that focused on rice cultivation was also accepted by the farmers.

Constraints

The most important constraint is the lack of water as there is no water resource near the village. This means that the farmers grow rice in the wet season only and they dig open wells to irrigate the vegetables.

A secondary constraint is the lack of technical support and the third pest attacks on crops, which they counter with pesticides bought at the local market.

Risks

When growing vegetables the farmers do not know what will happen after the vegetables are planted. Similarly rice growing is totally dependent on rainfall, which leaves them very much in the lap of the gods.

Focus Group Discussion 8 - Farmers, Kampong Thom, 15 March 2006

A group discussion meeting was held with nine farmers – five women and four men - at Khvek village, Kampong Thmor commune, Santuk district, Kampong Thom province on March 15, 2006. All of them are producers of wet season rice (one crop per year). The total number of households living in this village is 123 (138 families) and the total population is 604, of whom 296 are female.

Village production

Besides rice production, the farmers also grow watermelons, vegetables and other crops (eg. Mung bean, cucumber, morning glory, lemongrass, and eggplant). They also raise livestock (pigs and cows), mill and sell groceries from home to the village. There are six hand tractors in the village and about six people work outside the village in a garment factory.

The proportion of households occupied in various activities and the family income derived from them are described below

| Activities | Proportion of households in the village | Proportion of total income in the village |
|----------------------------|---|---|
| Paddy | 100 | 20 |
| Watermelon | 90 | 60 |
| Vegetable | 100 | 5 |
| Livestock and other crop | 100 | 15 |
| Milling and grocery seller | 22 | 5 |
| Total | 312 | 100 |

Note: Vegetable: 100 percent of households consume, while 10 percent of households also produce for sale

Pigs: all households own between 1 to 3 pigs and 10 percent own 10 pigs

Seed

All farmers use four rice varieties - Phka Rumdourl, Phka Mliss, Reang Chey, and Neang Rith. Five percent of households produce rice seed. Of these, Phka Mliss and Reang Chey produced higher yields (2 tonnes/ha) compared to the other two varieties, Phka Rumdourl (1.63 tonnes/ha) and Neang Rith (1.5 tonnes/ha). Phka Rumdourl is also susceptible to diseases such as red leaf or broken or short roots and plant.

The seeds are purchased from the Department of Agriculture and AQIP (50 percent), local farmers (49 percent) and from Anlung Veng (one percent).

There are two types of land in the village; upper and lower. Sometimes the villagers suffer from drought and sometimes there is too much water. The quality of seeds bought from the Department of Agriculture, AQIP and local farmers is acceptable to all farmers living in the village. However, the seed bought from Anlung Veng was very good. One problem is that the quality of seed was good at first, but is no longer good in the second and third years, so farmers retained part of their paddy as seed for the next year.

Fertilizers

All farmers use chemical fertilizers, namely DAP, 16-16-8-135, and Urea, with an average use of 1.5 bags (75kg) per hectare for paddy and 350kg/ha for vegetable. In general, they bought fertilizer from an agricultural cooperative (80 percent), Phnom Penh (four percent) and Kampong Thmor market (16 percent). The quality of fertilizers from the agricultural cooperative and Phnom Penh is good, but is not good from Kampong Thmor market.

There are three main problems that farmers encounter. First the quality of fertilizers with the same brand is inconsistent and difficult to recognize because the description is not in Khmer. Second no company sells fertilizers in the village and third the local market is not good for buying fertilizers because the price is high and the quality is low.

Pesticides

All farmers use pesticides, for watermelon, but not for rice. An average use of 1 liter/ha per season of pesticide is used for watermelon and is purchased from Kampong Thmor market (100 percent) where the quality is acceptable. Twenty percent of households use IPM for rice and vegetable growing, and generally, where there are few pests, this proves to be effective.

The main difficulties for farmers using pesticides are that they do not know the name of the pesticide or how to use it, as the name and directions are not written in Khmer and there is a lack of knowledge of the technique of using the pesticides. Farmers found that if they applied IPM alone, it was not effective, however if they use both IPM and pesticide it could increase yields.

Land Preparation

Ninety-five percent of farmers used animals for plowing and harrowing in a traditional method and only five percent of farmers used hand-tractors. In general, they plow and harrow twice for rice and three times for watermelon.

Farmers want to have modern farm equipment and materials such as threshing and harvesting machine. There is also a problem with soil quality, namely hard land and land-collapses.

Water Control, Irrigation, Transport & infrastructure

Farmers use rainfall to irrigate the rice fields, planting when the rain is heavy and use open wells to irrigate watermelons, vegetables and other crops. All households use the open wells for water. One difficulty for farmers is a lack of water for rice growing, so planting is often late and seasonally.

Transportation and infrastructure is not good yet, especially during the raining season. Twenty-two percent of households have motorized transportation.

Villagers use a water filtration tank, closed wells (40 percent) and open wells (100 percent). However, they still lack a closed well in the village for general use.

Post-harvest Activities & Processing

Most paddy is stored outside the house on mats and seeds are stored in bags inside the house. Normally about one percent of paddy is lost during storage. The main problems with harvesting are that it takes a long time and requires much labor and is costly at around 5,000-6,000 riel per day per person. So during harvest time there is a lack of labor.

For threshing, half of farmers used machines and the other half did it by hand. After threshing, the paddy is not very clean and there is a high charge rate of three percent for threshing. Lack of money to buy the wood to build the paddy storage unit and a difficulty in transporting to the village are problems too.

All households process rice with the village miller. However, the quality of rice is not good, for example the rice is neither clear nor smooth or is broken. The average recovery rate of paddy at the millers is 66 percent.

Marketing, Credit, & Extension Services

Most farmers (95 percent) bring paddy to sale to a middlemen at Kampong Thmor market. Only five percent of households sold paddy at the farm gate. However, farmers did not have a good relationship with the traders, who paid them a low price and complained about the quality.

About half the households get loans at five percent interest. The amount of the loans ranges from 20,000 to 30,000 riel and the length of loan is four months. About half of the farmers also receive extension services from the Department of Agriculture and NGOs. The service is acceptable and improves their knowledge on rice, vegetable and livestock production.

Farmer Organizations

Four groups have been formed by the farmers in the village, namely:

- A savings group that is running well;
- An organic rice planting group which is slow in getting paddy production;
- A chemical fertilizer supply community; and
- An agricultural cooperative, which has problems with late payments.

If a marketing group were to be introduced, it would not have any participation from the farmers, due to lack of awareness and understanding of the marketing process.

Previous Projects & Programs

There have been several projects and programs related to production, marketing, and processing of rice-based farming systems introduced to the village, namely:

- GTZ: a provincial development program. This activity was accepted, because it gave an opportunity for villagers to create a group.

- CBRDP (Community Based Rural Development Program): which established a community for chemical fertilizer supply. So far, this program has not encountered any problems.
- Stung Chinith project – (CEDAC): which provided agricultural extension services, applied the SRI system, used non-chemical fertilizer to change soil quality, covered crops, raised livestock and made compost fertilizer.

A CEDAC program has also been accepted, because it increased yield and the scheme also provided an incentive for successful farmers.

Constraints, Risks & Opportunities

The main constraints related to rice-based farming system in the village are:

- The lack of an irrigation system so that farmers can only plant wet season rice, which is dependent on rainfall. To solve this problem, they would like to have an irrigation system in the village, so that they can also grow dry season rice and grow better vegetables.
- Lack of good seed provider. They need help from the Department of Agriculture to provide a seed supplier.
- Lack of local markets. The Government should help to find market information about reasonably priced paddy.

The most important risks relate to watermelon production, which is dependent on natural water, rice farming because it is dependent on rainfall and pig raising where there are concerns about disease.

In the future, the farmers would like to increase their capital for rice farming. The total amount ranges from one to four million riel, of which they can contribute 45 percent. The other investment is a threshing machine, which costs about US\$12,000 of which they can contribute about 50 percent.

Three percent of farmers are very poor farmers, 23 percent are poor, 70 percent are non-poor and four percent are rich.

| Group | Proportion of households belonging to each group | The expected impact of the total investment on each group | The major impact on each group |
|-----------|--|---|--|
| Very poor | 3 percent | Positive change | Most impact on this group (price of threshing) |
| Poor | 23 percent | Not much change | Strong impact (saving time to do other activities) |
| Non-poor | 70 percent | Not much change | The same as above |
| Rich | 4 percent | Not much change | The same as above |