5.2 Participatory Rural Appraisal of Lower Ing Basin

(1) Introduction

The objective of the Kok-Ing-Nan Water Diversion Project is to divert water in the rainy season at a rate of 2,000 million m^3 per annum from the Kok and Ing Rivers to the Nan River, and finally to the Sirikit Dam in order to meet the growing water demand in the Chao Phraya Delta. The Donor Basins of the project are the Kok and Ing Basins and the Upper Nan Basin while the beneficiary area is the Chao Phraya Delta. Although the Project is expected to ease the shortage of water and bring further prosperity to the beneficiary area, the donor basins are likely to benefit only slightly or even suffer as the result of the Project. In addition, the fact that the Project's beneficiary area is the relatively rich Chao Phraya Delta, while the Project's donor areas are the relatively poor areas of Northern Thailand, raises a question of equity.[6] OEPP has also raised the issue of 'competitive water use', stating the importance of considering beneficial uses of the water in the donor basins as a first priority.[7]

Considering the above mentioned issues, and to ensure the regional equity and balance in economic development, a serious attempt should be made to improve the rural community environment in the donor basins prior to the implementation of the Project. Therefore, a study on the rural community and Participatory Rural Appraisal (PRA) of the donor area, with the Lower Ing Basin as an example, was included in the current study stage. This part of the study primarily aims to examine the current rural conditions, including primary factors impeding the rural development of the area. The study should serve as a baseline survey for any such future rural development projects in the area.

Albeit as an example, the reasons why this study was conducted in the Lower Ing Basin are:

- The project will divert 900 million m^3 of water from the Ing River, which is almost 45 % of the annual run-off of the River (compared to 20 % of run-off from the Kok River)[8]. This reduction of water may significantly affect the people downstream of the diversion canal because of lower soil fertility due to less flooding, disturbance of fisheries, etc.;
- It appears that this area represents a higher development potential due to the large population residing in this area (250,000 in the Lower Ing Basin compared to only 30,000 in the Lower Kok and Upper Nan Basins); and
- Most of the population in this area is engaged in agriculture but their present rural socio-economic conditions are rather depressed due to severe water shortages in the dry season and frequent flooding of the farm land along the river in the wet season.

(2) Overview of the Study Area

The Lower Ing Basin is shown in Figure 5.2.1. The Participatory Rural Appraisal study area in the Lower Ing Basin covers only the area downstream of the proposed Ing Diversion Weir, which includes three districts and one sub-district: Amphoe Thoeng; Amphoe Phaya Meng Rai; Amphoe

[6] GDP per capita in the Chao Phraya Delta is seven times that in the Kok and Ing basins (JICA Feasibility/Interim/ Summary Report p.5). The gap between the two areas is expected to widen further after the implementation of the Project according to the JICA Phase I Study.

[7] OEPP's official comment to RID on Kok-Ing-Nan Water Diversion Project, October 1997.

[8] The original plan expressed in the JICA Progress Report, March 1998.

Chiang Khong; and King Amphoe Khun Tal (King Amphoe Khun Tal was recently separated from Amphoe Thoeng)[9].

The following is a brief description of the study area based on the district level information on the above mentioned three districts and one sub-district from the Ministry of Interior (1996). The total population was 184,963, consisting of 93,917 male and 91,046 female, a sex ratio of 1:1. The total number of households was 42,243, of which 37,346 or 88% are farming households. The average number of household members is 4.4. There are 5,798 landless households or 16% of the total farm households. There are 9,681 men and 7,010 women currently working outside of their home communities. Agriculture land comprises 67% of the total area. Agriculture is mostly rain-fed with some supplemental irrigation in the rainy season; very little farming is currently possible during the dry season due to the shortage of water. Paddy is the major mono-crop cultivated by 35,589 households or 95% of the total farming households. The majority of the farmers are engaged in small-scale, semi-subsistence farming and the average farm area per farm household is 11.6 rai.

For the past decade the area has been going through unsustainable changes in land use resulting in increasing farmland and decreasing forest and wet land. Mono-culture of glutinous rice for semi-subsistence purposes is the predominant agriculture in this area, followed by maize cultivation for animal feed. Though the Ing and Lao Rivers are the main natural water resources in this sub-basin, the main source of agricultural water supply is rain water. Water shortages in the dry season are widespread and serious and water shortages in the rainy season occur during June, July and August due to rainfall variation. Flooding due to Mekong River intrusion usually occurs during August, September and October. Pumped irrigation by the Department of Energy Development and Promotion (DEDP) along the lower Ing River represents the only irrigation water supply at present.

(3) Objectives of the Study

This study aims to determine the present socio-economic conditions of the villages in the Lower Ing Basin and to identify the people's needs, as well as factors impeding development, which will be reflected in the future participatory and sustainable rural development projects in the area.

Conventional "top-down" approaches to the design of rural development projects have often failed to bring sustainable development of rural communities. A centralised decision-making process had previously left the rural communities without any role to play in the formulation of such projects. Such past experiences, and a realisation that people's participation is fundamental in project planning, are reflected in the Thai Government emphasis on people's participation in decision-making processes under the new constitution. The application of PRA in this study aims to present an alternative approach of formulating a sustainable rural development project, which is based on the needs of the people, and managed and controlled by the local communities.

(4) Methodology

(a) Sample Selection

This study covers mainly Amphoe Thoeng, Amphoe Phaya Meng Rai, Amphoe Chiang Khong and King Amphoe Khun Tal, which are located downstream of the proposed Ing Diversion Weir in the Lower Ing Basin. In order to select sample villages, the research team consulted with a local Non-formal Education officer in Chiang Rai, who was familiar with the area. As a result of the discussion, eleven villages were selected on the basis of their locations (both downstream and midstream villages along the Ing River, both upland and lowland villages,

[9] As administrative boundaries do not correspond to basin boundaries, the study area covers the major area of the mentioned districts and sub-district as well as a small area of Amphoe Mae Chiang, Amphoe Wiang Chai, Amphoe Chiang Kham and King Amphoe Song Kue.

i.e. villages with different effects from the Ing River and Mekong River). After a preliminary site survey in those eleven villages, six villages were selected for the interview survey. Simultaneously, one of the two villages from each of district was selected for a further PRA session, the selection being based on the active leadership characteristics of the village leaders. Figure 5.2.2 and Table 5.2.1 show the location of the villages and the field survey schedule, respectively.

Table 5.2.1. Sample Villages and Survey Schedule, 1998.

Map Number	Village Name	District	PRA	Interview Survey
1	Nong Bua	Thoeng	19-20 November	20 November
2	Huai Pheung	Thoeng		19 November
3	Wiang Wai	Phaya Meng Rai	21-22 November	22 November
4	Nong Sao	Phaya Meng Rai		21 November
5	Mai Don Kaew	Chiang Khong	18-19 December	18-19 December
6	Pak Ing Tai	Chiang Khong		23 November

(b) Development of Data Collection Instruments

The following four data collection instruments were developed to identify the present socio-economic conditions of each village and the villagers' intentions for rural development:

- Secondary data: Village Document (Khor Chor Chor 2 Khor, 1996) from the Department of Community Development, Ministry of Interior;
- Village Profile: general information on the village gathered by the research team through a site survey and key informant interviews;
- Interview Survey of the sampled households based on a structured questionnaire format; and
- Participatory Rural Appraisal (PRA).

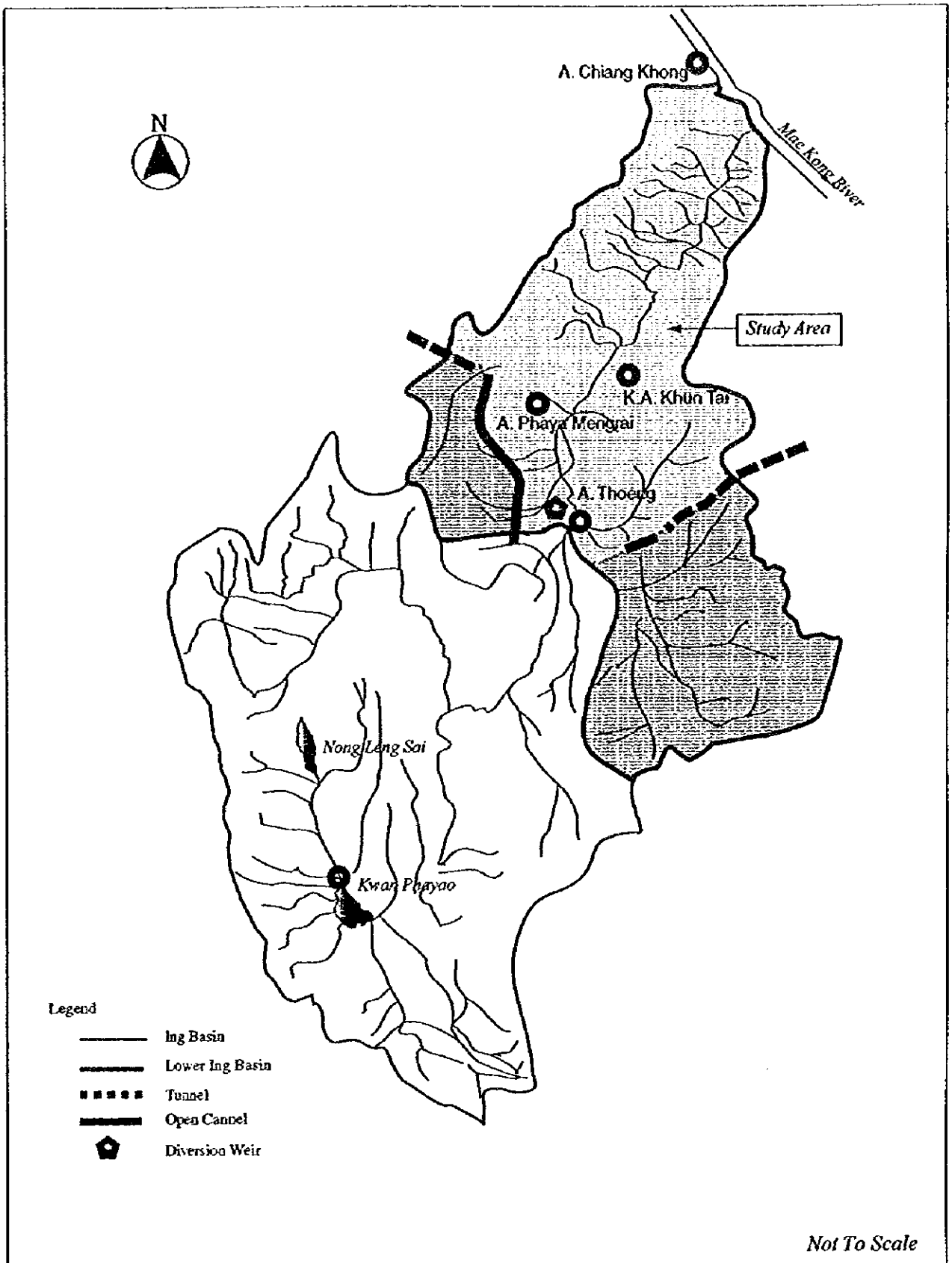
(c) Training of Research Personnel

Although the conduct of actual PRA sessions was entrusted to an experienced PRA facilitator from Chiang Mai University and his assistants, two half-day introductory sessions were organised for the research team in order to familiarise them with PRA techniques and to aid the facilitator.

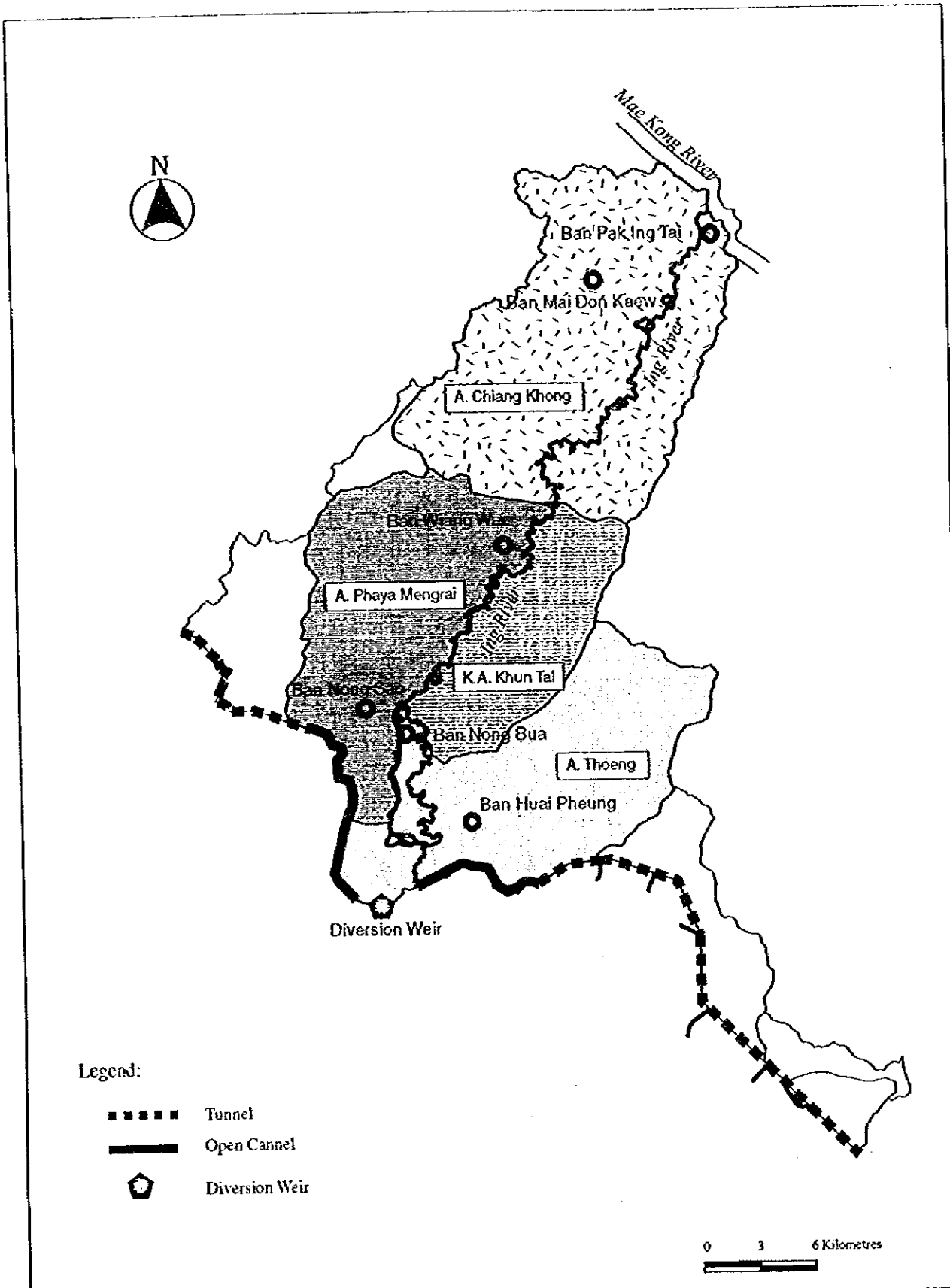
To ensure smooth communications with the villagers in northern Thai dialect, 10 students, majoring in Rural Community Development, at Chiang Rai Rachabat Institute, were recruited as enumerators for the interview survey. Prior to the survey, the enumerators underwent two half-day orientation and training sessions on the Project, the interview techniques and data recording methods.

(d) Data Collection Procedures

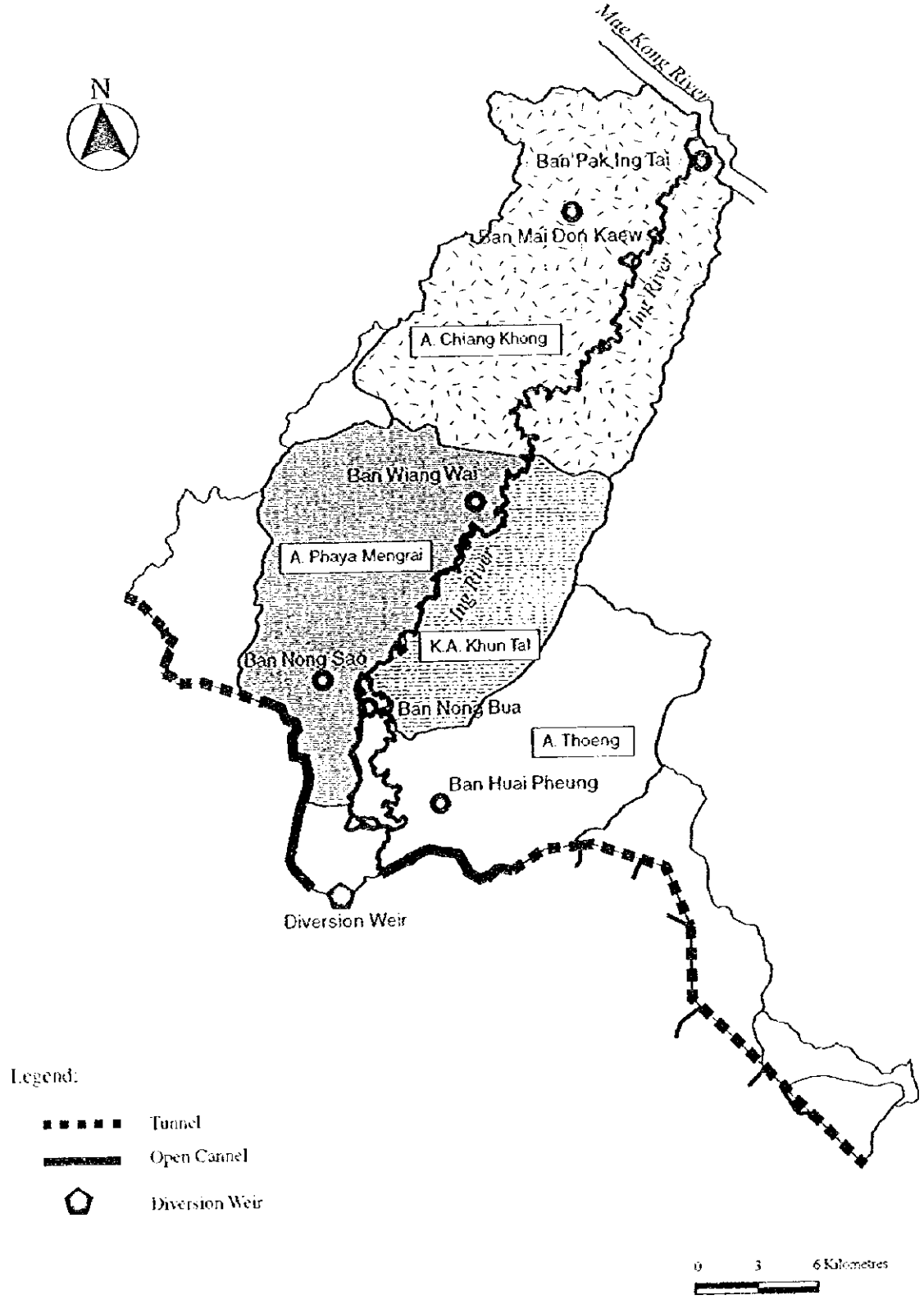
During the preliminary site survey for the sampling selection, some basic information was collected through a discussion with each village headman. After the selection was made, a research assistant visited each of the six villages and discussed the survey procedure and set the survey date. The Village Document and the village map were collected and reviewed.



ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	**Figure 5.2.1. Lower Ing Basin and Study Area**
JAPAN INTERNATIONAL COOPERATION AGENCY	



ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	Figure 5.2.2. Location of Surveyed Villages
JAPAN INTERNATIONAL COOPERATION AGENCY	



ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	Figure 5.2.2. Location of Surveyed Villages
JAPAN INTERNATIONAL COOPERATION AGENCY	

A PRA was conducted in three villages (see Table 5.2.1). The research team spent two half-days in each village conducting PRA sessions using such tools as focus group discussion, mapping, drawing, ranking, informal conversation and transects. The main focus was to let villagers formulate a basic plan for future development of the village by identifying the past situation of the village, then comparing it with their current situation and desired, or future, situation.

The interview survey by the enumerators was conducted in all six villages including the three villages where PRA was conducted (see Table 5.2.1) under the supervision of the research team. In selecting respondents, a village map indicating the location of each household was obtained. From the map, households were randomly selected using sub-sections of the village. Approximately 30 % of the number of households in each village was taken as the basis for determining the sample size. In case no one was found at home in the selected households (due to the rice harvest season this did happen frequently), alternative households were chosen within the village sub-section. Simultaneously, information for the Village Profile was gathered by the research team through interviews with key informants such as the village headman, school teachers and village committee members.

(e) Data Analysis

The secondary data together with the Village Profile was analysed by the research team to understand the general features of the village. The interview survey data were analysed village by village using frequency, percentage and grouping. The information gathered during the PRA sessions was mainly analysed on site by the villagers.

(5) Profile of Sample Villages

This section gives the profile of each of 6 sample villages: geography and land use; socio-economic background; agriculture; domestic water and electricity; education and health; and housing and sanitary conditions. This profile is based on the information from the Village Document 1996, supplemented with the information obtained from the key informants such as the village headman, elders, schoolteachers and village committee members. The relevant information from the Village Document is found in *Supporting Report*.

Table 5.2.2. Village Document 1996

Village Name	Total Area (rai)	Farmland (rai)		Population	No. of Household
Nong Bua	3,960	2,860	72.2%	395	84
Huai Pheung	570	465	81.6 %	416	105
Wiang Wai	3,500	2,000	57.1%	935	173
Nong Sao	4,774	3,700	77.5%	1,109	188
Mai Don Kaew	4,486	1,851	41.3%	722	178
Pak Ing Tai	1,000	600	60.0%	898	178

(a) Ban Nong Bua

Geography and Land Use

Ban Nong Bua is located in Tambon Sansai Ngam, Amphoe Thoeng. The village has a total area of 3,960 rai, of which 2,860 rai (72.2 %) is farmland and 26 rai is forest: a

community forest with an area of 23 rai and a cemetery forest of 3 rai[10]. Due to the inundation of farmland, between only 50 and 74 % of farmland is currently used. The village is surrounded by the Ing River in the north and north-east and by the Klong Gua in the west and south-west.

Socio-economic Background

In 1996, Nong Bua had 84 households and a population of 395, of which 46.1 % were males and 53.9 % were females. With respect to age, 8.6 % were under the age of 6 years, 14.4 % were between 6 and 12 years old, 16.2 % were between 12 and 18 years old, 45.8 % were between 18 and 50 years old and the remaining 15.0 % were over the age of 50.

Farming is the main source of livelihood and 83 households (99%) were engaged in this activity in 1996. However, because of the lack of water there is no farming activity in the dry season. A large number of villagers (48 men and 38 women in 1996) leave the village during off-farm periods to work in town, mainly in Bangkok. 76 households (90.5%) had more than one job and their average annual income was 15,000 Baht in 1996.

25 households (29.8%) have no land of their own and they rent a plot mainly from other villagers. Another 9 households (10.7 %) also rent some land in addition to their own.

Agriculture

Agriculture is the primary economic activity in the village despite the fact that no farming is possible in the dry season due to lack of water. Out of 83 farming households, 76 households (91.6%) grow paddy in the rainy season. The average yield of paddy was 400 kg/rai in 1996. Regarding the size of paddy field, 50 households (65.8%) have fields of between 6 and 10 rai in area, 20 households (26.3%) between 11 and 20 rai and the rest have less than 5 rai. Additionally, 30 households grow maize for animal feed, 13 households grow cassava and 5 households grow fruit trees.

Paddy fields in the western side of the village are rain-fed and supplemented by water from a small irrigation ditch whose water comes from Klong Gua. In the south and south-eastern part of the village there is another irrigation canal, into which water was originally pumped up from the Ing River.

Domestic Water and Electricity

According to the Village Document 1996, Nong Bua had no water supply system to provide clean water to the villagers[11] and none of the households had sufficient clean drinking water from the local water sources such as rain water, shallow wells and deep wells. Although the village has one public and 4 private deep wells, and 12 public and 1 private shallow wells, water shortage is severe during the dry season. All the households are supplied with electricity.

Education and Health

The village has a primary school (years 1-6) with 50 pupils and 5 teachers of whom one is the headmaster. All the children between the age of 6 and 12 attend school. Although

[10] Although only 23 rai of community forest was mentioned in the Khor Chor Chor 2 Khor 1996, the village headman confirmed that there was an additional 3 rai forest at the village cemetery.

[11] According to the site survey and the interview survey, the village currently has a water supply system.

there is no secondary school in the village, most of the children (10 out of 11 students who completed the primary school in 1995) go on to secondary school in a nearby village. In 1996, 18 students were studying in a lower secondary school and 40 in a higher secondary school. The village has a small pre-school provided by the Department of Community Development. Currently, one trained person looks after 16 children. In the village there is a Community Health Centre, which carries out the primary health care of the villagers. Basic health care is adequately provided, including vaccination programmes for new-born babies and children, delivery of a baby with professional assistance and family planning. In 1996, of 10 children under the age of five, 7 children had slight malnutrition (Level 1) and 3 had medium malnutrition (Level 2).

Housing and Sanitary Conditions

56 households (66.7%) have a house with a tile or concrete roof while the remainder have a house with a zinc or other metal roof[12]. Out of 84 households, only 44 households (52.4%) have a modern toilet with a septic tank, the other have no toilet facility in or near the house. 80 households (95.2%) have a kitchen meeting the sanitary standard.

(b) Ban Huai Pheung

Geography and Land Use

Ban Huai Pheung, located in Tambon Wiang, Amphoe Theong, is a small village with a total area of 570 rai, of which 465 rai (81.6%) is farmland and 13 rai is a community forest. The village is surrounded by three rivers and streams: the Ing River in the west; Huai Hin Lek Fai in the south; and Huai Kong Kaeng in the north.

Socio-economic Background

In 1996 Huai Pheung had 105 households and a population of 416, of which 53.4 % were males and 46.6 % were females. With respect to age, 5.3 % were under the age of 6 years old, 11.8 % were between 6 and 12 years old, 11.5 % were between 12 and 18 years old, 54.8 % were between 18 and 50 years old and the remaining 16.6 % were over the age of 50.

Farming is the main source of livelihood in the village and 97 households (92%) were engaged in farming in 1996. Due to lack of water, little farming is carried out in the village during the dry season. Some villagers (20 men and 13 women in 1996) leave the village during the dry season in order to find work in town, mainly in Bangkok, for more than 3 months a year. 97 households (92%) had more than one job and their average annual income was 50,000 Baht in 1996, and the remaining 8 households gained their income solely from farm labour with the average income of 10,800 Baht.

9 households (8.6%) have no land of their own and rent a plot of land, generally from other villagers. Another 10 households (9.5 %) also rent some land in addition to their own land.

Agriculture

Agriculture is the main economic activity in the village. All the 97 farming households grow paddy once a year in the rainy season. The average yield of paddy was 500 kg/rai

[12] Roofing material is one of the criteria used to assess the quality of housing in the Khor Chor Chor 2 Khor. The three categories given are: a tile or concrete roof; a zinc or other metal roof; and a nipa or grass roof.

in 1996. Out of the 97 farming households, 80 households (82.5%) have a paddy field of between 6 and 10 rai in area, 15 households (15.6%) between 11 and 20 rai, and 2 households have a field of between 21 and 50 rai. In addition to paddy, 80 households grow garlic.

A small number of farmers, who have their fields near the Ing River, pump up the water from the river. However, the cost of electricity to operate the pump is too expensive (70 Baht/hour) for many of the farmers to cultivate any crops in the dry season.

Domestic Water and Electricity

The village has its own water supply system and all the 105 households have clean water throughout the year according to the Village Document. There are 3 public and 1 private deep wells, and 2 public and 12 private shallow wells in the village. All the households are supplied with electricity.

Education and Health

The village has a primary school with years 1 to 6. All the children between the age of 6 and 12 attend the school. Although there is no secondary school in the village, most of the children go to secondary school in a nearby village. All the 9 children who completed the primary school in 1995 continued their studies in a secondary school. In 1996, 51 children attended the village primary school, 6 students were studying in a lower secondary school and 4 in a higher secondary school. The village has a Community Health Centre, which carries out the primary health care of the villagers. In 1996, of 21 children under the age of 5, 14 children had normal nutritional condition and 7 had slight malnutrition (Level 1).

Housing and Sanitary Conditions

69 households (65.7%) have a house with a tile or concrete roof, 35 (33.3%) have a house with a zinc or other metal roof and 1 household has a house with a grass roof. Of 105 households, 102 (97.1%) have a modern toilet with a septic tank, while the remaining 3 household have no toilet facility in or around the house. 100 households (95.2%) have a kitchen meeting the sanitary standards.

(c) Ban Wiang Wai,

Geography and Land Use

Ban Wiang Wai, located in Tambon, Amphoe Phaya Meng Rai, has a total area of 3,500 rai, of which 2,000 rai (57.1%) is farmland and 80 rai is community forest. The village is surrounded by hills, namely Doi Tao and Doi Man Pla, in the west and the Ing River in the east. Areas close to the Ing River are periodically inundated.

Socio-economic Background

In 1996 the village had 173 households and a population of 935, of which 51.7% were males and 48.3% were females. With respect to age, 8.2 % were under the age of 6 years old, 6.6 % were between 6 and 12 years old, 12.9 % were between 12 and 18 years old, 60.1 % were between 18 and 50 years old and the remaining 12.1 % were over the age of 50.

Farming is the main economic activity, in which 138 households (79.8%) were engaged in 1996. Unlike other villages, those 138 households have no other job but paddy cultivation in the rainy season. Their average annual income was 10,000 Baht in 1996, while that of 35 households who have more than one job was 18,000 Baht in the same year. As there is no possibility of farming during the dry season due to the shortage of water, some villagers (21 men and 21 women in 1996) move to other parts of the country, mainly to Bangkok, in order to find a job for more than 3 months a year.

80 households (46.2%) have no land of their own and rent a plot mainly from other villagers. Another 12 households (6.9 %) also rent some land in addition to their own land.

Agriculture

Agriculture is the main economic activity. All the 138 farm households grow paddy once a year in the rainy season. As noted in the previous section, many of the villagers have no land of their own and rent a plot from other villagers. As regards the size of paddy field, whether the land is owned or rented, it varies considerably. 80 households (58.0%) have a field of between 11 and 20 rai in area, 30 households (21.7%) a field less than 5 rai, 20 households (14.5%) between 21 and 50 rai, 5 households between 6 and 10 rai and 3 households have a field bigger than 50 rai. The average yield of paddy was 400 kg/rai in 1996. 20 households also grow beans.

There is a 6-km long concrete irrigation canal around the village. The water is pumped into the canal from the Ing River at the DEDP pumping station south-east of the village.

Domestic Water and Electricity

According to the Village Document 1996, the village has its own water supply system, which provide 158 households (91.3%) with clean water throughout the year. There are 6 public deep wells, 2 public and 21 private shallow wells in the village. 158 households (91.3%) have electricity.

Education and Health

The village has a primary school with year 1 to year 6. All the children between the ages of 6 and 12 attend the school and some children from neighbouring villages also attend the same school. Though there is no secondary school in the village, most of the children go to secondary school in a nearby village. All the 18 children who completed the primary school in 1995 went on to secondary school. In 1996, 48 children were in the village pre-school, 88 in the village primary school, 56 in a lower secondary school, 43 in a higher secondary school and 10 in a tertiary school. Although there is no Community Health Centre in the village, there is a Child Development Centre. In 1996, of 59 children under the age of 5, there were 4 children with slight malnutrition (Level 1) and the rest had normal nutritional conditions.

Housing and Sanitary Conditions

80 households (46.2%) have a house with a tile or concrete roof, 89 (51.4%) have a house with a zinc or other metal roof and 4 have a house with a grass roof. All the 173 households have a modern toilet with a septic tank. 130 households (75.1%) have a kitchen meeting the sanitary standards.

(d) Ban Nong Sao

Geography and Land Use

Ban Nong Sao, located in Tambon Meng Rai, Amphoe Phaya Meng Rai, has a total area of 4,774 rai, of which 3,700 rai (77.5%) is farmland and 200 rai is community forest. The Ing River runs northwards about 3 km east of the village. Due to the inundation of farmland, between 75 and 90 % of the farmland is currently used.

Socio-economic Background

In 1996 Nong Sao had 188 households with a population of 1,109, of which 49.7% were males and 50.3% were females. With respect to age, 8.1 % were under the age of 6 years old, 13.4 % were between 6 and 12 years old, 13.3 % were between 12 and 18 years old, 55.3 % were between 18 and 50 years old and the remaining 9.8 % were over the age of 50.

Farming is the main source of livelihood in the village and all 188 households were engaged in farming in 1996. Some villagers (20 men and 20 women in 1996) move to another part of the same province during off-farm periods in order to find work. All 188 households had more than one job and their average annual income was 15,000 Baht in 1996.

13 households (6.9%) have no land of their own and they rent a plot generally from other villagers. Another 82 households (43.6%) rent some land in addition to their own land.

Agriculture

Agriculture is the main economic activity in the village though no farming is possible during the dry season due to water shortages. All 188 households grow paddy once a year in the rainy season. 92 households (48.9%) have a paddy field of between 11 and 20 rai in area, 63 households (33.5%) between 21 and 50 rai, 26 households (13.8%) between 6 and 10 rai and the remaining 7 households have a paddy field larger than 50 rai. In addition to paddy, 182 households grow maize for consumption.

Domestic Water and Electricity

The village has its own water supply system, which provides 175 households (93.1%) with clean water throughout the year. There are 4 public deep wells, and 7 public and 74 private shallow wells in the village. All the households have electricity.

Education and Health

The village has a primary school with year 1 to year 6. All the children between 6 and 12 years old attend the school. Although there is no secondary school in the village, most of the children go on to a secondary school in a nearby village (for example, all the 18 children who completed primary school in 1995 continued their education). In 1996, 61 children attended the village pre-school, 124 the village primary school, 35 were studying in a lower secondary school, 75 in a higher secondary school and 8 in a tertiary school. The village has both a Community Health Centre and a Child Development Centre. In 1996, of the 65 children under the age of 5, 41 children (63.1%) had normal nutritional conditions, 23 children (35.4%) were found with slight malnutrition (Level 1) and 1 child with medium malnutrition (Level 2). Basic health care, such as vaccination programmes for new-born babies and children and delivery of a baby with professional assistance,

was provided adequately. However, the use of contraceptive measures among married couples (of which the wife is between 15 and 44 years old) was 68% in 1996, which was second lowest among the sample villages.

Housing and Sanitary Conditions

56 households (29.8%) have a house with a tile or concrete roof, 126 (67.0%) a zinc or other metal material roof, and the remaining 6 a grass roof. 177 households (94.2%) have a modern toilet with a septic tank, but the rest have no toilet facility in or around the house. 151 households (80.3%) have a kitchen meeting the sanitary standards.

(e) Ban Mai Don Kaew

Geography and Land Use

Ban Mai Don Kaew, located in Tambon Huai Saw, Amphoe Chiang Khong, is the largest (in terms of area) of the 6 villages sampled with a total area of 4,486 rai, of which 1,851 rai (41.3%) is farmland. The Ing River is about 7 to 10 km east and south-east of the village. Two streams, Huai Rong Thart and Huai Nam Rin, flow through the village.

Socio-economic Background

In 1996 Mai Don Kaew had 178 households and a population of 722, of which 53.2% were males and 46.8% are females. With respect to age, 7.2 % were under the age of 6 years old, 7.8 % were between 6 and 12 years old, 14.4 % were between 12 and 18 years old, 57.9 % were between 18 and 50 years old and the remaining 12.7 % were over the age of 50.

Although no farming is possible during the dry season due to water shortages, farming is the main economic activity, in which 150 households (84.3%) were engaged in 1996. Some villagers (12 men and 18 women in 1996) leave the village during the dry season in order to find work in town, mainly in Bangkok, for more than 3 months a year. All 178 households had more than 1 job to support the family and their average annual income was 50,000 Baht in 1996.

33 households (18.5%) have no land of their own and rent a plot generally from their parents or relatives. Another 50 households (28.1%) rent some land in addition to their own land.

Agriculture

Agriculture is the main occupation of the villagers. Of 178 households, 150 (84.3%) are engaged in farming. All 150 households grow paddy once a year in the rainy season. The average yield of paddy was 500 kg/rai in 1996. 70 households (46.7%) have a paddy field of between 11 and 20 rai in area, 50 households (33.3%) between 21 and 50 rai and the remaining 30 households (20%) between 6 and 10 rai. In addition to paddy, 30 households grow maize for consumption and 8 households grow fruit trees.

Domestic Water and Electricity

According to the Village Document 1996, the village had no village water supply system[13]. The village has 4 public deep wells, 3 public and 150 private shallow wells.

[13] According to the site survey and the interview survey, the village currently has a water supply system.

Only 22 households (12.4%) have an access to clean drinking water throughout the year. 168 households (94.4%) have electricity.

Education and Health

Unlike other sample villages, Mai Don Kaew has both a primary school and a secondary school. All the children between 6 and 12 years old attend the primary school and most of them continue to secondary school (all 12 children who completed the primary school in 1995 went to secondary school). The secondary school, established in 1987, has 982 students, of whom most are from other villages, and 31 teachers[14]. In 1996, 31 children attended the pre-school, 77 the primary school, 43 a lower secondary school, 28 a higher secondary school and 11 were in a tertiary school. The village has both a Community Health Centre and a Child Development Centre. Basic health care is adequately provided including vaccination programmes for new-born babies and children, delivery of a baby with professional assistance and family planning. In 1996, all 39 children under the age of 5 had normal nutritional conditions.

Housing and Sanitary Conditions

120 households (67.4%) have a house with a tile or concrete roof and the remaining 58 have a house with a roof of zinc or other metal. All 178 households have a modern toilet with a septic tank as well as a kitchen meeting sanitary standards.

(f) Ban Pak Ing Tai

Geography and Land Use

Ban Pak Ing Tai, located in Tambon Sri Don Chai, Amphoe Chiang Khong, is a village with a total area of 1,000 rai, of which 600 rai (60%) is farmland and 120 rai is a community forest. The village is located at the confluence of the Ing River with the Mae Khong River.

Socio-economic Background

Unlike other sample villages, Pak Ing Tai has a number of Laotian immigrants. The first immigrants were from Luang Pra Bang Province in Lao and they fled from the Indochina war in 1913.

In 1996 Ban Pak Ing Tai had 178 households with a population of 898, of which 50.3 % were males and 49.6% were females. With respect to age, 8.2 % were under the age of 6 years old, 12.4 % were between 6 and 12 years old, 14.1 % were between 12 and 18 years old, 52.1 % were between 18 and 50 years old and the remaining 12.7 % were over the age of 50.

Farming is the main economic activity in the village and 170 households (95.5%) were engaged in this activity in 1996. Some villagers (23 men and 12 women in 1996) leave the village during the dry season to find a job in other regions for more than 3 months a year. 172 households (96.6%) had more than one job with their average annual income of 14,000 Baht and the remaining 6 households (3.4 %) obtained their income solely from wage labour in 1996.

[14] information from the teacher during the site survey in December, 1998.

15 households (8.4%) have no land of their own and rent a plot from other villagers. Another 33 households (18.5%) rent some land in addition to their own land.

Agriculture

Agriculture is the primary economic activity in the village. This is the only village, among the sample villages, which practise some farming during the dry season. Out of 170 farm households, only 30 (17.6%) grow paddy. 20 households (66.7%) have paddy fields of between 6 and10 rai in area, 7 households (23.3%) between 1 and 5 rai, and the remaining 3 households between 11 and 20 rai. The average yield of paddy rice was 250 kg/rai in 1996, which was much lower than that of the other sample villages. 172 households grow maize for consumption, 120 grow green peas, 20 grow tobacco and 20 grow fruit trees.

Domestic Water and Electricity

According to the Village Document 1996, there was no village water supply system[15]. Although the village has 7 public deep wells, 3 public and 2 private shallow wells, 108 households (60.7%) do not have sufficient clean drinking water from local water sources. All the 178 households have electricity.

Education and Health

The village has a pre-school from the DCD and a primary school with year 1 to year 6. All the children between 6 and 12 years old attend the school. There is no secondary school in the village. In 1995, out of 15 children who completed the primary school, only 11 children proceeded to a secondary school. In 1996, 20 children attended the pre-school, 107 students were in a primary school, 6 in a lower secondary school[16], and 6 in a higher secondary school. The village has both a Community Health Centre and a Child Development Centre. Basic health care, such as vaccination programmes for new-born babies and children and delivery of a baby with professional assistance, are all adequately provided for. The use of contraceptive measures among married couples (of which the wife is between 15 and 44 years old) was 63% in 1996, which was the lowest among the sample villages. In 1996, of 52 children under the age of 5, 36 had normal nutritional conditions, 15 had slight malnutrition (Level 1) and 1 had medium malnutrition (Level 2).

Housing and Sanitary Conditions

85 households (47.8%) have a house with a tile or concrete roof, 67 (37.6%) a zinc or other metal material roof, and the remaining 26 have a grass roof. All 178 households have a modern toilet with a septic tank. 168 households (94.4%) have a kitchen meeting sanitary standards.

(6) Results from the Interview Survey

This section gives the summary results from the interview survey conducted in the six sample villages. The section is divided into four sub-sections: profile of the respondents; living conditions; agriculture; and the people's needs and perception of community development. All the data from the interview survey are found in the *Supporting Report*.

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[15]According to the site survey and the interview survey, the village currently has a water supply system, which provides clean water to some households for part of the year.

[16]Though stated in the Khor Chor Chor 2 Khor, this seems an error as there were 11 students in the year 7.

(a) Profile of the Respondents

Sex, Age and Civil Status

There were altogether 274 respondents consisting of 142 males (51.8 %) and 132 females (48.2 %). Bang Non Sao and Ban Mai Don Keaw had more female than male respondents, respectively 54.2 % and 66.0 %. The respondents were between the age of 15 and 78 years old and the average age of the respondents was 46 years old. More than half (56.9 %) of them were between 36 and 60 years old, 21.5 % were between 16 and 35 and 20.1 % were over 60. There were 3 respondents (1.1 %) who were 15 years old. The majority (82.5 %) of the respondents were married, 7.7 % were single, 7.3 % were widows or widowers and 6 % were separated or divorced.

Origin and Daily Language

From the respondent's ancestral origin and daily language, the sample villages can be classified into two types: predominantly northeastern (I-san); and predominantly northern. Nong Bua and Nong Sao belong to the former and Huai Pheung, Wiang Wai, Mai Don Kaew and Pak Ing Tai belong to the latter, though all the villages have mixture of people from different regions. In response to the question concerning the respondent's ethnic group, nearly one-thirds of the respondents did not give an answer.

For Nong Bua, the majority (96.0 %) of the respondents were from I-san (north-eastern region), mainly from Roi Et (64.0 %) and Kalasin (20.0 %) provinces. One respondent was from Nan province in the northern region. 84.0 % of the respondents normally speak I-san dialect and the remaining 16.0 % northern dialect.

For Huai Pheung, 76.5 % were from the northern region, mainly (70.6 %) from Chiang Rai province, 20.6 % were from I-san such as Kalasin (14.7 %) and Nong Khai (5.9 %) provinces and one respondent was from Songkhla province in the south region. 82.4 % of the respondents usually speak northern dialect, 11.8 % I-san dialect and the rest standard central Thai.

The majority (85.7 %) of the respondents in Wiang Wai were from the northern region, mainly from Chiang Rai (67.4 %) province. One respondent was from Roi Et province in the north-eastern region. 6 respondents did not give the answer to the question. 46 respondents (93.9 %) normally speak northern dialect and the rest I-san dialect.

For Nong Sao, the majority (88.1 %) were from I-san, mainly from Roi Et (39.0 %) and Sakol Nakorn (35.6 %) provinces, and the remaining 2 were from Chinag Rai province in north region. 5 respondents declined to give an answer to this question. The majority of the respondents (93.2 %) normally speak I-san dialect, 7 (11.9 %) northern dialect and the remaining one respondent speaks standard central Thai. These figures include 4 respondents who answered that they use both I-san and northern dialects as daily language.

For Mai Don Kaew, all except one respondent (98.1 %) were from the northern region such as Chiang Rai (94.3 %) and Chiang Mai (3.8 %) provinces. The remaining one respondent was from Udon Thani province of I-san region. 98.1 % of the respondents normally speak northern dialect and the remaining one respondent I-san dialect.

For Pak Ing Tai, 40 respondents (74.1 %) were from the northern region, namely from Chiang Rai (72.2 %) and Chiang Mai (1.9 %) provinces, 7 respondents (13.0 %) were

from I-san region, namely from Roi Et (11.1 %) and Khon Kaen (1.9 %) provinces. None of them stated that they were from Lao Republic, though 6 respondents (11.1 %) declined to answer this question. 24 respondents (44.4 %) normally speak northern dialect, 23 (42.6 %) I-san dialect and 6 (11.1 %) Lao.

Occupation

The majority of the respondents (74.8 %) were farmers. The proportion of farmers among the respondents in each village ranges from 63.0 % in Pak Ing Tai, 69.4 % in Wiang Wai, 74.6 % in Nong Sao, 79.2 % in Mai Don Kaew, 80.0 % in Nong Bua and to 91.2 % in Huai Pheung. The others were private business entrepreneurs (8.4 %), wage workers (2.6 %), salary workers (1.5 %) and public officers (1.1 %). 19 respondents (6.9 %) had no job, 11 (4.0 %) were still in education and 2 (0.7 %) were pension receivers.

Educational Level

Of all 274 respondents, 32 respondents (11.7 %) had no formal education while the rest (88.3 %) had at least completed primary school. 6.2 % of the respondents completed lower secondary school (M3) and 5.8 % completed higher secondary school (M6). There were, however, no respondents who had completed tertiary education. The ratio of those who had no formal education was 7.0 % for male and 16.7 % for female.

Religion

Of 274 respondents all, except three respondents, (98.9 %) were Buddhist. There were 3 respondents who were Christian: one in Wiang Wai and 2 in Pak Ing Tai.

(b) Living Conditions

Household Size and Structure

The average household size of all the respondents was 4.4, ranging from 3.6 in Mai Don Kaew, 3.9 in Huai Pheung, 4.2 in Nong Bua, 4.4 in Pak Ing Tai, 4.6 in Wiang Wai and to 5.1 in Nong Sao. The overall sex ratio of the household members was almost 1:1 or, more accurately, 50.2 % males and 49.8 % females. With regard to age, 23.5 % of the household members were under the age of 15, 36.9 % were between the age of 16 and 35 years old, 29.5 % between 36 and 60 years old and the remaining 10.1 % were over the age of 60. All the household members, except 27 members whose relation to the respondent was not specified, were related to the respondent by kinship. 177 households (64.6 %) were nuclear families, consisting of husband, wife and children.

About 10 % of the household members live temporarily (more than 3 months) outside the community to have a job, mainly during the dry season. Although in all the villages a larger number of men than women emigrate temporarily, the number differs from village to village: in Nong Bua, 11.3 % of men and 2.8 % of women; in Huai Pheung 15.5 % of men and 9.5 % of women; in Wiang Wai 13.9 % of men and 11.7 % of women; in Nong Sao 8.7 % of men and 4.7 % of women; in Mai Don Kaew 18.8 % of men and 16.0 % of women; and in Pak Ing Tai 7.7 % of men and 7.4 % of women.

Occupation and Income

Almost half of the household members (49.8 %) were farmers. 66 members (5.5 %) were entrepreneurs in private business, 51 (4.2 %) were wage-workers, 49 (4.0 %) were

salary-workers and 11 (0.9 %) were public officers. 109 members (9.0 %) had no job and one person was a pension receiver. 321 members (26.5 %) were students or the children under the school age.

The average annual income of all the surveyed households was 25,411 Baht, excluding 8 respondents who did not answer this question. The average annual income in each village was: 28,278 Baht in Nong Bua; 27,580 Baht in Huai Pheung; 27,262 Baht in Wiang Wai; 25,288 Baht in Nong Sao; 21,301 Baht in Mai Don Kaew; and 25,527 Baht in Pak Ing Tai. Over two-fifths of the households (42.0 %) stated that their annual income was over 30,000 Baht. For the majority (59.1 %) of the households the main source of income came from the sale of agricultural products. Rice was the main product to sell in all the villages except Pak Ing Tai where selling maize brought the major income for 42.6 % of the households. The following is the major income source of the surveyed households in each village.

In Nong Bua the sale of agricultural products was the main source of income for 68.0 % of the households (48.0 % by selling rice; 12.0 % maize; and 8.0 % fruits). For 16.0 % of the households salaries and wages from permanent or temporary jobs were the main income source and the remittances from family members were the major income source for one household.

In Huai Pheung the sale of agricultural products was the main income source for 58.8 % of the households (35.3 % by selling rice; 11.8 % maize; and 11.8 % vegetables). 17.6 % of the respondents obtained the main income from salaries of permanent jobs and 8.8 % from the remittances from family members and another 8.8 % from private businesses. There were two households (5.9 %) whose main income source was the sale of livestock and dairy products.

In Wiang Wai 61.2 % of the households obtained their main income by the sle of agricultural products (44.9 % rice and 16.3 % maize). 14.3 % from salaries and wages, 6.1 % from the remittances from family members, 4.1 % from private business and another 4.1 % from selling livestock and dairy products.

In Nong Sao the sale of agricultural products was the main source of income for 59.3 % of the households (44.1 % rice; 13.6 % maize; and 1.7 % vegetables). 15.3 % of the households obtain their main income from the remittances of family members, 13.6 % from salaries and wages and 6.8 % from private businesses.

In Mai Don Kaew the sale of agricultural products was the main source of income for 47.2 % of the households (41.5 % rice; 3.8 % fruits; and 1.9 % vegetables). Private businesses were the main source of income for 24.5 % of the households while 20.8 % obtained their main income from wages from temporary jobs, 5.7 % from the remittances from family members and 1.9 % from selling livestock and dairy products.

In Pak Ing Tai the sale of agricultural products was the main income source for 64.8 % of the households (42.6 % maize; 14.8 % vegetables; 5.6 % fruits; and 1.9 % rice). 18.5 % of the households obtained their main income form salaries and wages, 9.3 % from private businesses, 3.7 % from remittances from family members and 1.9 % from selling livestock and dairy products.

Expenditure, Savings and Debts

The average annual expenditure of all the surveyed households was 24,008 Baht, excluding the 8 respondents (2.9 %) who declined to give an answer. The average amount

of annual expenditure in each village was: 24,180 Baht in Nong Bua; 26,150 Baht in Huai Pheung; 24,510 Baht in Wiang Wai; 22,531 Baht in Nong Sao; 22,576 Baht in Mai Don Kaew; and 24,930 Baht in Pak Ing Tai. Over two-fifths of the households (40.9 %) stated that their annual expenditure were more than 30,000 Baht.

In regard to the amount of saving, 97 respondents (35.4 %) declined to give an answer to this question. The majority of respondents in Huai Pheung (82.4 %) and Wiang Wai (87.8 %) did not give an answer. Out of all 274 respondents 59 respondents (21.5 %) said that they had no savings at all. The ratio of respondents with no savings was: 68.0 % in Nong Bua; 55.6 % in Pak Ing Tai; and 22.6 % in Mai Don Kaew. The average savings of the households who answered to this question was 32,109 Baht. The average savings of the households in each village was: 55,500 Baht in Nong Bua; 42,667 Baht in Huai Pheung; 43,500 Baht in Wiang Wai; 39,778 Baht in Nong Sao; 25,265 Baht in Mai Don Kaew; and 10,625 Baht in Pak Ing Tai.

For the amount of debt, 52 respondents (19.0 %) declined to give an answer and only 12 (4.4 %) stated that they had no debt. The remaining 210 respondents (76.6 %) had some debt. The average debt of the households who answered to this question was 50,118 Baht. In each village the average amount of debt was: 68,045 Baht in Nong Bua; 60,186 Baht in Huai Pheung; 66,531 Baht in Wiang Wai; 25,659 Baht in Nong Sao; 43,316 Baht in Mai Don Kaew; and 64,487 Baht in Pak Ing Tai.

Drinking Water, Cooking Fuel and Electricity

For drinking water, many households utilise more than one source. A little less than half (46.7 %) of the respondents make use of the village water supply system, over two-fifths (43.4 %) use rain water[17], 18.6 % water from shallow wells and 12.0 % from deep wells. 15 respondents (5.5 %) stated that they buy bottled water. The situation is, however, quite different from village to village.

For Nong Bua, the majority (72.0 %) make use of the water supply system, over two-thirds (68.0 %) rain water, 12.0 % water from shallow wells and 8.0 % water from deep wells.

For Huai Pheung, the majority of the respondents (82.4 %) obtain drinking water from rain, 14.7 % from shallow wells, 11.8 % from the village water supply system, 11.8 % from bottled water and 2.9 % from deep wells.

For Wiang Wai, the majority (98.0 %) use the village water supply, 8.2 % from shallow wells, 2.0 % from deep wells and 2.0 % from rain water.

For Nong Sao, more than half of the respondents (57.6 %) rely on rain water, around half of the respondents (50.8 %) from shallow wells, 18.6 % from the village water supply system, 8.5 % from by purchasing bottled water and 5.1 % from deep wells.

For Mai Don Kaew, a little less than half of the respondents (49.1 %) obtain drinking water from deep wells, one-third (32.1 %) from the village water supply system, 18.9 % from rain water and 17.0 % from shallow wells.

[17] In northern Thailand rainwater is the preferred source of drinking water. Rainwater is usually collected during the rainy season and stored in big jars.

For Pak Ing Tai, more than half of the respondents (55.6 %) make use of the village water supply system, 53.7 % from rain water, 11.1 % from bottled water and 5.6 % use water from the river.

For cooking-fuel, many households use a combination of different types of fuel. The most common source is wood (78.1 %), secondly gas (58.4 %) and charcoal (27.4 %). Though the ratio of users to each type of fuel is different from village to village, all the villages showed the same order, wood, gas and charcoal.

For electricity, all 274 respondent households are supplied with electricity.

Household Possessions

271 households (98.9 %) have a house of their own while 3 respondent households in Pak Ing Tai have no house of their own. The majority (98.2 %) of the households have a toilet in the house while one in Nong Bua and 4 in Pak Ing Tai do not have a toilet facility in or around the house.

The most common possessions of the surveyed households are: a television set (95.6 %); an electric fan (93.8 %); a refrigerator (75.2 %); a tape recorder (72.6 %); an electric iron (70.8 %); and a radio (40.9 %). For vehicles, over two-thirds of the respondent households (67.2 %) have a motorcycle (including a tricycle, which is widely used in Thailand), 59.1 % have a bicycle, 16.8 % have a car (mainly a pick-up type) and only 3 respondent households (1.1 %) have a truck.

Regarding the question about an item they wish to acquire in the future, 99 respondents (36.1 %) stated either that they did not have any item they wish or they did not specify an item. 39 (14.2 %) wish to buy a pick-up car and 20 (7.3 %) a washing machine.

Wastewater Management

None of the surveyed villages have a modern sewage system, though 10 respondents (3.6 %) stated that they discharge wastewater into a waste pond. All the other respondents, except 4 who did not give an answer to this question, stated that they pour wastewater on the ground, in the hole or on trees.

Protein Sources

The common sources of protein were pork (92.7 %), fish (88.3 %), eggs (86.5 %), chicken (85.0 %), beef (69.3 %) and buffalo (64.6 %). A small number of respondents also stated duck, snake, frog, rat, snail and crab as protein sources. The majority of the respondents (86.1 %) eat one of the above protein sources daily.

Communal Organisations and Activities

All the surveyed villages have community organisations of different kinds, though 53 respondents (19.3 %) stated that they did not belong to any organisation and 60 respondents (21.9%) declined to give an answer to this question. The remaining 161 respondents (58.8 %) belong to at least one of the organisations.

For Nong Bua, 6 respondents (24.0 %) belonged to some kinds of farmers' organisations, 11 respondents (44.0 %) were members of social organisations such as a men's group

and a housewife group and 4 respondents (16.0 %) of a funeral group[18]. One respondent did not belong to any organisation and 3 respondents did not answer this question. The housewife group and the funeral group were stated to have an important role in the village community life.

For Huai Pheung, 5 respondents (14.7 %) were members of an agricultural co-operative bank, 20 respondents (58.8 %) belonged to a social group such as a village group and men's group and 21 respondents (61.8 %) belonged to a funeral group and one respondent to a criminal prevention group. 3 respondents did not belong to any organisation and one respondent did not give an answer to this question. The same as Nong Bua the housewife's group and the funeral group were stated to have an important role in the village community life.

For Wiang Wai, 26 respondents (53.1 %) belonged to a farmers' organisation such as a saving bank/group and BAAC. 5 respondents (10.2 %) belonged to a social organisation such as a housewife group and a youth group. 26 respondents (53.1 %) belonged to a funeral group and 2 respondents to a volunteer group for public health. 16 respondents did not belong to any organisation and 7 respondents did not give an answer to this question. The majority (67.4 %) of the respondents stated none of the groups have an important role regarding their community life.

For Nong Sao, 48 respondents (81.4 %) did not give an answer to this question and 2 respondents did not belong to any organisation. The remaining 9 respondents belonged to the following (one respondent to each group): co-operative bank; village cow raising group; village group; men's group; housewife group; youth group; weaving group; teachers' co-operative group; and a social group (which the respondent did not specify). The majority (89.8 %) stated none of the groups have an important role in the village community life.

For Mai Don Kaew, 19 respondents (35.8 %), the largest portion of the respondetns among the sample villages, did not belong to any organisation. 31 respondents (58.5 %) were members of farmers' organisations, namely BAAC and a village rice bank group. 34 respondents belonged to a social organisation such as housewife group, an old people's group and a village group. One respondent belonged to a funeral group and another to a Christian group. There was one respondent who belonged to other than the above mentioned groups, though he did not specify the type of the group. The housewife group, agricultural co-operative group and funeral group were stated to have important roles in the village community life.

For Pak Ing Tai, 15 respondents (27.8 %) belonged to a farmers' group, 17 respondents (31.5 %) to a social organisation, 3 respondents (5.6 %) to a religious organisation and 21 respondents (38.9 %) to another type of organisation (no specific descriptions were given). 12 respondents (22.2 %) did not belong to any organisation. The housewife's group and the funeral group were stated to have an important role in the village community life.

In all the surveyed villages the custom of reciprocal help (helping each other in certain occasions without an exchange of money) is practised, though the extent of this custom varies from village to village. The common occasions for this custom are at the time of rice harvesting (62.4 %), a temple fair (16.4 %) and a house building (11.7 %). Contrary to the majority of the respondents, 55 respondents (20.1 %) stated there were no such custom in their society. The proportion of the respondents who stated the existence of

[18] A Buddhist organisation for helping the members at the time of family member's death.

such a custom at the time of rice harvesting in each village is: 16.0 % in Nong Bua; 73.5 % in Huai Pheung; 79.6 % in Wiang Wai; 32.2 % in Nong Sao; 74.1 % in Pak Ing Tai; and 83.0 % in Mai Don Kaew. The proportion of the respondents who stated that there was no such custom in their society is: 4.0 % in Nong Bua; 11.8 % in Huai Pheung; 8.2 % in Wiang Wai; 44.1 % in Nong Sao; 11.1 % in Pak Ing Tai; and 26.4 % in Mai Don Kaew.

All the surveyed villages have several systems of caring for weak or disadvantaged people such as elderly people, AIDS-patients, disabled people and the poor. All the villages except Nong Sao have a system of caring for elderly people, 4 villages except Nong Sao and Mai Don Kaew have a system of taking care of AIDS-patients. Mai Don Kaew and Pak Ing Tai also have a system of caring for disabled people and donating goods to the poor. Huai Pheung, Wiang Wai and Nong Sao have a welfare card system for the poor and the disabled.

Natural Disasters

All the surveyed villages suffer from both droughts and flooding, respectively 73.0 % and 62.4 % of the respondents stated their occurrence, and these were the two most problematic natural disasters stated by the respondents. The proportion of the respondents who stated that droughts were the most severe problem was: 24.0 % in Nong Bua; 82.4 % in Huai Pheung; 34.7 % in Wiang Wai; 42.4 % in Nong Sao; 40.7 % in Pak Ing Tai; and 41.5 % in Mai Don Kaew. For flooding, 44.0 % in Nong Bua; 17.7 % in Huai Pheung; 40.8 % in Wiang Wai; 52.2 % in Nong Sao; 35.2 % in Pak Ing Tai; and 32.1 % in Mai Don Kaew. Although the extent is much less, 94 respondents (34.3 %) stated the occurrence of wind damage and 28 respondents (10.2 %) soil erosion.

Major Concerns in Life

The most commonly stated concerns were over money: debt (20.8 %); imbalance between earnings and expenditures (20.1 %); difficulty in generating income (16.1 %); and need of money for children's education (9.9 %). The others were insufficient agricultural products (5.1 %) and illness (4.4 %). 40 respondents (14.6 %) stated that they had no particular concerns in life and 53 respondents (19.3 %) did not give an answer to this question.

(c) Agriculture

Land Tenure

Out of 274 sample households, 36 households (13.1 %) owned no land at all and 100 households (36.5 %) owned no farmland, although many of them have land of their family for farming. The number of households without own farmland was particularly high in Huai Pheung (55.9 %) and Pak Ing Tai (42.6 %). The average land owned per household was 9.5 rai and the average land owned and rented was 10.7 rai.

Crops and Planted Area

In the rainy season 196 households (71.5 %) grow paddy, 100 households (36.5 %) grow maize, 57 (20.8 %) vegetables, 12 (4.4 %) groundnuts, 5 (1.8 %) upland rice, 2 (0.7 %) soya or black beans and 1 household (0.4 %) tobacco. The average planted area for paddy was 12.6 rai per household, for maize 7.1 rai per household and for vegetables 1.8

rai per household19. Paddy is the major crop for all the villages except Pak Ing Tai where only 7 households (13.0 %) grow rice. In Pak Ing Tai, 26 households (48.1 %) grow maize, 20 (37.0 %) grow vegetables and 17 (31.5 %) grow fruit trees.

There is very little farming in the dry season. No sample households grow paddy or upland rice in the dry season. Only 5 households (1.8 %) grow maize, 5 households (1.8 %) grow vegetables and another 5 households (1.8 %) grow groundnuts in the dry season.

There are 55 households (20.1 %) who have an orchard and their average planted area was 5.4 rai per household.

Agricultural Machines and Tools

The possession of durable agricultural machinery was rare among the respondent households. The common items were: water pump (36.9 %); tiller (27.4 %); trailer (9.5 %); E-tan20 (6.9 %); thresher (2.2 %); tractor (1.5 %); and rice mill (0.7 %). For agricultural tools, the most common items were: hoe (88.0 %); sickle (81.0 %); harrow (34.3 %); hand sprayer (29.2 %); and spade (10.6 %).

Livestock and Poultry

Of 274 respondents, 36 households (13.1 %) raise cows and of which 32 households (88.9%) keep between 1 and 4 cows, 3 households between 5 and 9 cows and 1 household keeps between 10 and 14 cows. In Huai Pheung, more than half of the respondents (64.7 %) have a small number of cows, while in Mai Don Kaew none of the respondents raise cows. There were 2 households, which keep buffaloes in Wiang Wai. There were altogether 12 households which raise pigs: 8 households in Mai Don Kaew: 2 households in Nong Sao; one household in Wiang Wai and Pak Ing Tai.

Poultry are more popular and the majority of the respondent households (84.3 %) keep some chickens. There were 23 households (of which 11 were in Nong Bua) which keep some ducks. For most cases poultry was kept for a small number for the family consumption, but some operate a large-scale chicken farm for a commercial purpose.

Aquaculture

A little less than one-fifth of the respondents (19.0 %) are engaged in aquaculture of sweet-water fish such as catfish, tilapia, snake-head fish and carp. Among these 52 fish farmers, the average size of a fishpond is 0.9 rai. For the feeding 30 fish farmers use natural method (no special feeding), 12 feed with feeding pellets, 2 fish farmers combine the two methods and the remaining 8 respondents did not specify. 28 fish farmers stated that they encounter several constraints on aquaculture such as fish stealing, flooding of ponds, slow growth of fish, high cost of feeds, drainage problem and shallowness of ponds.

If loans are available from BAAC, a little over two-fifths of the respondents (42.7 %) stated that they would dig a fishpond. Such a response was high in Nong Bua (60.0 %) and Wiang Wai (81.6 %).

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[19] The average among those who grow the particular crop.

[20] E-tan is a widely used local open-roof truck, mainly used for transporting farm products and materials.

Agricultural Constraints

The following were the major constraints stated: lack of irrigation water (62.4 %); lack of funds (51.1 %); damage by insects (48.2 %); plant disease (44.9 %); and lack of farm land (34.7 %). A lack of irrigation water was the most severe problem stated in all the sample villages, except Wiang Wai. Though many of the problems were common in the sample villages, each village has different order of problems.

For Nong Bua, the major problems were: lack of irrigation water (77.0 %); lack of fund (68.0 %); insufficient farm input (68.0 %); lack of farmland (60.0 %); and damage by insects (56.0 %).

For Huai Pheung, lack of irrigation water (88.2 %); plant disease (88.2 %); lack of funds (70.6 %); damage by insects (52.9 %); and lack of farmland (47.1 %).

For Wiang Wai, damage by insects (83.7 %); plant disease (59.2 %); lack of funds (53.1 %); lack of irrigation water (46.9 %); and insufficient farm input (44.9 %).

For Nong Sao, lack of irrigation water (74.6 %), lack of funds (50.9 %); damage by insects (42.4 %); plant disease (42.4 %); and insufficient farm input (39.0 %).

For Mai Don Kaew, lack of irrigation water (58.5 %); damage by insects (52.8 %); lack of funds (39.6 %); plant disease (37.7 %); and poor marketing system (34.0 %).

For Pak Ing Tai, lack of irrigation water (46.3 %); lack of funds (40.7 %); lack of farmland (29.6 %); insufficient farm input (27.8 %); and poor drainage (16.7 %).

Fertiliser and Pesticides

The use of fertiliser is widespread: 81.0 % of the respondents used some kind of fertiliser on their crops. The majority used compound chemical fertilisers while less than 3 % used manure. The use of pesticides is less common. A little over one-third of the respondents used insecticides (36.5 %) and rodenticides (31.4 %). Less than one-third of the respondents (31.0 %) used herbicides and a small number of respondents (9.1 %) used fungicides.

Post-harvest Measures

About one-third of the respondents (34.3 %) practise some post-harvest measures on their crops, such as drying, threshing, grinding, box /sack packaging and streaming. Such practices differ from village to village. In Pak Ing Tai only 14.8 % of the respondents practise post-harvest measures while in Nong Sao 61.0 % of the respondents do. Of 146 respondents (53.3 %) who currently do not practise post-harvest measures, only one-fifth of the respondents (21.2 %) expressed the desire of practising them in the future.

Marketing of Farm Products

In regard to the marketing of farm products, out of 274 respondents 190 respondents (69.3 %) usually rely on a middleman while 26 respondents (9.5 %) market directly. 58 respondents did not answer to this question. The price of the product was usually determined by guaranteed price (46.4 %) and by following the market price (34.3 %). In regard to their selling prices, a little over one-third of the respondents (35.4 %) were usually satisfied with the price while a little less than half (47.1 %) were usually not. The respondents stated that they obtain information on marketing of farm products through

"word-of-mouth" communication with neighbours (54.4 %), by TV economic news (33.6 %) and radio programmes (15.0 %). As the major problems concerning the marketing, a large fluctuation of prices (47.1 %) and the system of middleman (40.5 %) were expressed.

Agricultural Extension and Promotion

The major sources of information on agricultural extension and promotion were: TV programmes (34.3 %); neighbours' suggestions (32.1 %); meetings organized by governmental offices and private organisations (27.7 %). The majority of the respondents (85.4 %) stated the need of "Agricultural Information Centre", which will provide the farmers with relevant agricultural information.

Rural Credit

More than half of the respondents (56.6 %) make use of rural credit systems while a little over one-third (35.0 %) do not. Among the users, the most popular credit source was BAAC (72.3 %). For all the sample villages, except Pak Ing Tai, BAAC was the most common source of credit. In Huai Pheung and Mai Don Kaew, BAAC is the only source of rural credit mentioned. For Pak Ing Tai, unlike other villages, the most common source of credit is Rice Bank (50.0 %), then secondly, BAAC (23.7 %) and thirdly Co-operative Centre (15.8 %). Pak Ing Tai also has the largest proportion of respondents who make use of a credit system (70.4 %).

Of 155 credit users, the average amount of credit was 50,866 Baht. Regarding the credit conditions, the annual interest rate was stated as: between 10 and 15 % (48.4 %); less than 5 % (12.9 %); between 5 and 10 % (10.3 %); and more than 15 % (6.5 %), while 21.9 % of the credit users did not answer the question. Payment period was stated: not limited (3.9 %); within an year (36.8 %); between 1 and 5 years (25.2 %); between 5 and 10 years (10.3 %); and more than 10 years (0.6 %), while 24.5 % of the credit users did not give an answer.

Of the 155 credit users, the main uses of credit were for: farming (36.8 %); livestock and fish farm (11.0 %); family expenses (7.7 %); building of a house (7.7 %); children's education (3.9 %); buying a car (3.9 %); and trade (3.2 %). More than quarter of the respondents (26.5 %) did not specify their credit use.

Dry-Season Farming

More than three-quarter of the respondents (78.1 %) stated that they would like to cultivate crops during the dry season if enough water were available. The reasons given were to increase income (42.5 %), to promote agriculture (36.4 %) and for self-consumption (22.9 %). The types of crops they would like to grow were vegetables (67.8 %), fruit such as mango, lychee and longan (13.6 %), maize (10.7 %) and rice (9.3 %). 37 respondents (13.5 %) stated that they have no intention of starting dry season farming even if water were available. Two-thirds of respondents (69.0 %) stated beneficial to pump water from the rivers to their farmlands. Such a request was particularly high in Nong Sao (79.7 %), Huai Pheung (79.4 %) and Nong Bua (72.0 %).

(d) People's Needs and Perception of Community Development

Participation in Community Development Projects

Nearly two-thirds of the respondents (65.7 %) stated that the villagers have occasions to discuss about community development projects. The major topics of such discussions were: community improvement (44.4 %) such as road construction, installation of water supply system and digging of wells; agriculture development (36.7 %); and water resource development (13.3 %).

During the past 5 years all the surveyed villages had implemented some kinds of community development projects. All the villages implemented projects on water resource development such as digging ponds and construction of weirs. All the villages except Don Mai Kaew had projects on village improvement such as road construction, installation of water supply system and digging of wells, and also projects relating to aquaculture. Both Mai Don Kaew and Pak Ing Tai had an income-generating project such as weaving. Huai Pheung and Nong Sao had agricultural development projects. Nong Bua and Nong Sao had a livestock project. A tourist development project was implemented in Pak Ing Tai, a public health project in Wian Wai and a project relating to political awareness in Nong Sao.

Only 51 respondents (18.6 %) stated that they had a chance to express their opinions during the initial stage of project planning or implementation, while the majority (72.6 %) stated that there was no such occasion to express their opinions.

Types of Project Considered to be Beneficial

An irrigation project was the most desired project in all the sample villages. In total 164 respondents (59.9 %) stated that an irrigation project would benefit the community.

In the field of agriculture, apart from irrigation projects, vegetable cultivation (17.2 %), fishery (12.4 %) and livestock (12.0 %) were also stated to be beneficial in all the 6 villages.

In the field of income-generation and livelihood, dress-making (21.2 %), agro industry (19.7 %) and vocational training (19.0 %) were the top projects addressed to be beneficial. For education, starting or upgrading a high school (33.9 %) was the top agenda and a literacy programme (17.9 %) was the second. For public health, improving a health centre and medical facilities (28.1 %), improving health and medical care (25.2 %) and provision of medicine (14.6 %) were addressed as beneficial.

Crop Diversification

The majority (85.0 %) of the respondents stated that, if the situation permits, they would like to diversify their agricultural products. Among the respondents who gave the types of crops they want to grow, the most common products were vegetables (60.2 %) and orchard products (31.0 %). The main reasons of selecting above mentioned products were good price (more income than the current products), less work (easy to grow) and necessity for self-consumption.

Engaging in New Business

About two-fifths (40.1 %) of the respondents stated that they had a plan to start a new business, while over half (52.2 %) did not have such a plan. The types of business

mentioned were: trading (13.9 %); cultivation of new types of crops (6.6 %); livestock (4.0 %); and processing of farm products (2.9 %).

Kok-Ing-Nan Water Diversion Project

A little over one-third of the respondents (37.6 %) knew about this project and the main sources of information were: conversations with neighbours and relatives (9.9 %); TV or radio programmes (7.7 %); and village leaders and village meetings (4.4 %). Concerning the impact of the project in the area21, 13.5 % of the respondents stated that certainly there would be impacts, 26.3 % maybe some impacts, 42.3 % no impact and the remaining 17.9 % either did not answer the question or stated uncertainty. 108 respondents, who stated that the project would certainly or maybe have impacts in the area, expressed the following positive and negative impacts.

Positive impacts stated were:

- the project will bring enough water to the area throughout the year (41.3 %);
- the project will prevent floods (13.8 %); and
- the project will prevent river bank erosion (3.7 %).

Negative impacts expressed were:

- the project would cause more flooding (18.3 %);
- the project would cause loss of land (10.1 %);
- the project will cause shortage of water (7.3 %);
- the project would cause loss of forest (6.4 %);
- the project would cause soil erosion near the river bank (4.6 %); and
- the project would cause imbalance of ecosystem (4.6 %);

(7) PRA: A Means of Formulating Sustainable Community Development Projects

This section describes the process and outcome of PRA sessions conducted in three sample villages, Nong Bua, Wiang Wai and Mai Don Kaew. The final objective of the PRA session was to help villagers formulate their own community development project based on the information presented during the session. It was fortunate that, at the time of site survey, villagers were interested in applying to SIF (Social Investment Fund)[22], which was to fund community-oriented projects, and that they were motivated to use the opportunity of PRA sessions for formulating their proposal.

For a PRA session, the attitude and the behaviour of a facilitator is of prime importance, which often determines the success or the failure of the session. The role of a PRA facilitator is not to lecture or teach, but to assist local people do their own investigations, analyse the situation, set priorities, plan and act for the process of their own development. It is fundamental that the facilitator has genuine trust that the local people are capable of determining their own future. Among other qualities, the facilitator has to have a good communication skill with the local people, an attitude of listening and learning without his/her pre-conceived ideas, flexibility and inventiveness to use different techniques to guide the session along the process.

The two main techniques used during the PRA sessions were focus group discussions and transects. The research team spent two-half days in each village, starting with a focus group discussion with 20-30 representatives of the villagers, consisting of two people from each sub-village section and representatives from relevant groups such as village committee, farmer's group, housewife group and youth group. The group was sometimes separated into sub-groups to focus on different

[21] At this stage, the outline of the Kok-Ing-Nan Project was explained to the respondents.
[22] See the note on World Bank's SIP (Social Investment Project), on page 5-141.

issues or to avoid sexual and social barriers, which might prevent people from talking freely. The outcomes of sub-group discussions were always shared with the whole group at the end of each session. Such techniques as mapping, drawing, listing, scoring and ranking were used during the focus group discussions in order to gather information, to identify problems and to prioritise the issues. A series of transects (walking through the village with villagers) was also conducted, usually on the second day, to gather more information through observation and informal conversations with the villagers.

The final formulation of community development projects was entrusted to the villagers themselves. The outcome of PRA sessions should be owned by the villagers and used according to their wishes. It was not the research team's intention, in this study stage, to be involved in the formulation of a project. As stated in (3) Objectives of the Study, our main aim was to present an alternative approach of formulating a sustainable community development project, which is based on the needs of the people, and managed and controlled by the local communities.

(a) PRA Session in Ban Nong Bua (19-20 November, 1998)

Introduction

The first PRA session was arranged at 9:30 a.m. at the village temple. 21 villagers (13 men and 8 women) gathered at the temple. After the warm greeting expressed by the village headman, the PRA facilitator introduced the research team and explained the objectives and procedure to the villagers.

History and Problems in the Past

The facilitator asked the group to describe village life in the past. Mainly elderly men spoke about their experiences from the time they migrated from the North-eastern Region and the early years of their life in this area. The following is the summary of their account. In the 1960s because of the poor soil and drought, groups of people from the North-eastern Region (I-san) of Thailand migrated to this area. They first settled in Sansai Ngam, a village 4 km south of Nong Bua, and started extending their paddy fields and houses in the direction of the current Ban Nong Bua, where land was fertile and abundant surrounded by thick bushes and two rivers: the Ing River and Klong Gua. In those days, land was allocated free of charge so that families could expand their cultivated land depending on their available manpower, by clearing the forest and land close to the village. There were plenty of wild animals, edible plants, mushrooms, fish and firewood in the area. Gradually more people from different provinces of I-san settled in Nong Bua because of the better availability of these resources.

When the facilitator asked about the problems they had faced in those early years, some mentioned dangers from wild animals, no access to town except walking, no educational or health facilities, flooding in the rainy season, poor sanitary conditions, conflicts between the local inhabitants and the I-san migrants, etc. The problems they encountered in the past were listed on a large sheet of paper (Figure 5.2.3).

Figure 5.2.3. Nong Bua: List of Past Problems.

PROBLEMS IN THE PAST
1. Poor communication
2. Low level of education
3. Poor standard of sanitation (eating habits, no toilet, no health service)
4. No electricity
5. Conflicts between local people and I-san immigrants

They acknowledged that all these problems no longer existed and the life had improved considerably, though they were currently facing different types of problems. Then, the group was divided into two groups: one consisting of men and one consisting of women. The female group drew a village map of the past and a map of the present[23] (Figure 5.2.4).

Existing Problems

The facilitator asked the groups about the problems they were now facing. The male and female groups each drew up a list of existing problems and ranked each problem using small stones (Figures 5.2.5 and 5.2.6). The groups discussed possible solutions to each problem, though the solution was not always found.

Needs for Community Improvement

For the male group the most pressing problem was the lack of water in the dry season. They recognised that some of the other problems, such as drug addiction of youth and out-migration of villagers, stemmed from the fact that they were not able to farm during the dry season. The male group focussed their discussion on the possible methods of supplying water from the Ing River to their fields. During the discussion the following experiences were shared.

(1) In 1993 the local authority provided the village with an electric water pump. The farmers shared the cost of electricity and pumped water from the Ing River to their fields. However, when the pump broke down in 1994, no one took responsibility and the broken pump is still lying in the former village headman's house. (2) There are several storage ponds in the village. A few years ago, a large pond (27 rai) was built by the government to store water in the north-eastern part of the village, at a cost of 300,000 Baht. The pond, however, cannot hold water in the dry season due to seepage.

After some discussions they concluded that they should build a water pumping station on the bank of Ing River and extend the existing canal into upland paddy fields in the western side of the village. They were confident that if water were available during the dry season their life would improve tremendously and some of the social problems would also be eliminated. The group decided to work further on this plan and apply to SIF24 for funding.

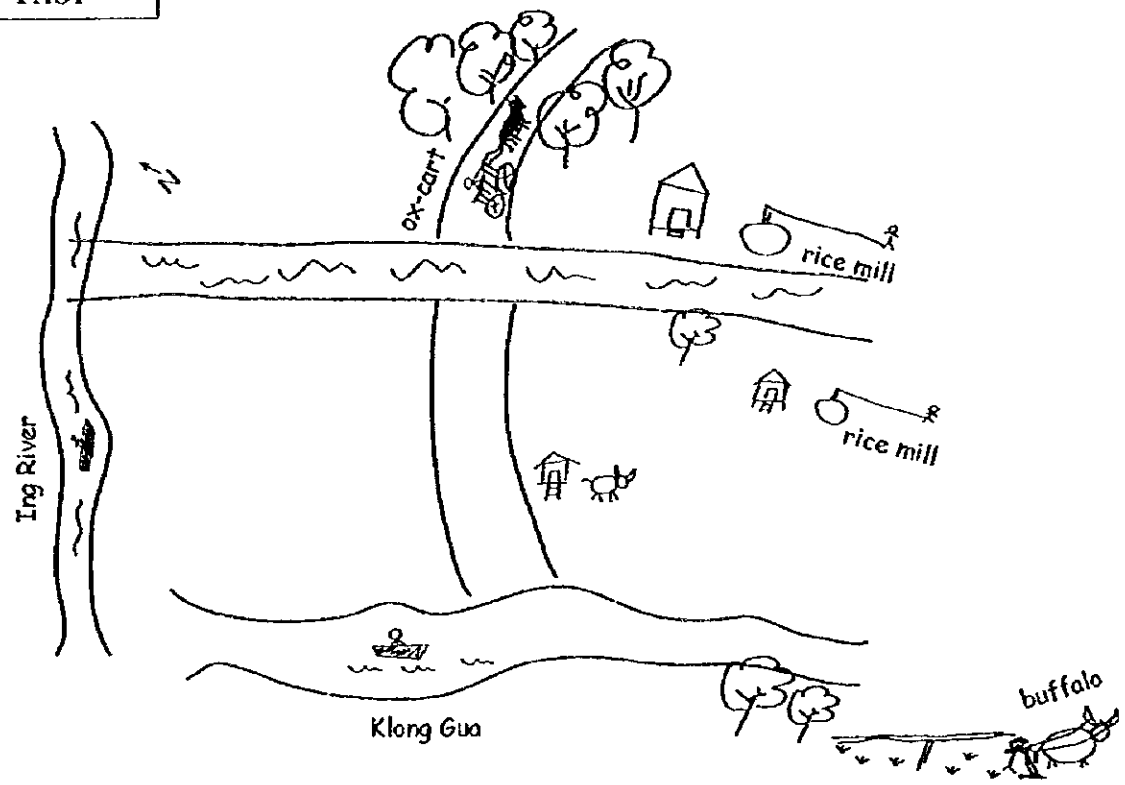
The female group discussed ways to improve their community life and drew a village map that illustrates their improved village life (Figure 5.2.7). They discussed the needs of

[23] The maps presented in the Report were redrawn by the research team as close as the original maps drawn by the villages.
[24] Social Investment Fund from the World Bank. See Section 5.7 for the details.

installing a water pump at the bank of the Ing River, so that villagers can start a community kitchen garden (of vegetables for self-consumption). They talked about the need for income-generating projects for women, as after the rice harvest season they currently have no job opportunities in the village. They talked about setting up a vocational training centre, which will provide the villagers with practical skills to start side businesses. They also talked about improving the marketing system within the village as well as in co-operation with neighbouring villages. They expressed the possibility of setting up a co-operative shop and a village market place. They also discussed the possibility of obtaining agricultural machinery, such as harvesters and tractors, under a co-operative system. They also discussed the need for a regular bus service to and from the town and some facilities for youth, such as a children's playground and a youth centre with sports facilities.

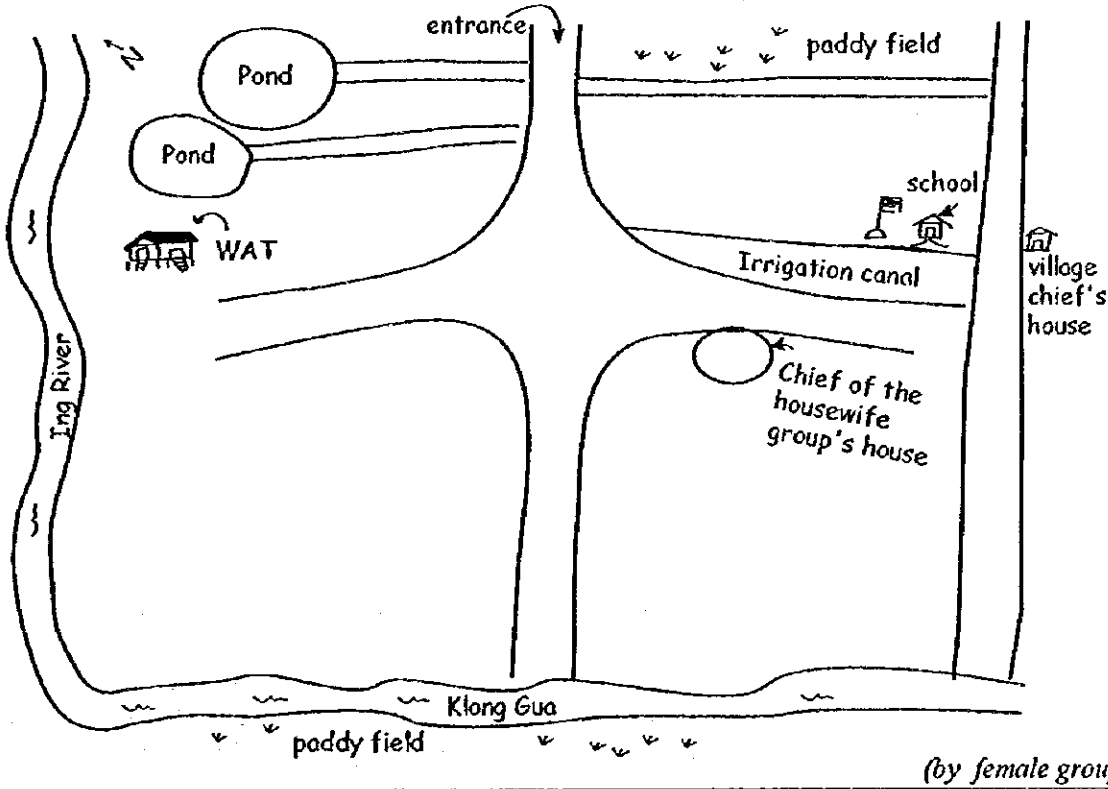
Photographs of the PRA session are shown in Figure 5.2.8.

PAST



(by female group)

PRESENT



(by female group)

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	**Figure 5.2.4. Nong Bua : Past and Present Village Maps**
JAPAN INTERNATIONAL COOPERATION AGENCY	

Figure 5.2.5. Nong Bua: List of Existing Problems (by male group)

EXISTING PROBLEMS
1. Lack of water in the dry season
2. Health problem
3. Drug addiction (especially for youth)
4. Seepage of water in the public pond
5. Lack of farmland (about 10 % of the villagers have no farmland)
6. No water pump
7. People leaving the village for work
8. Soil deterioration
9. Deforestation
10. Marketing problems
11. Water pollution from the use of herbicides
12. Debt (many villagers are BAAC debtors)

Figure 5.2.6. Nong Bua: List of Existing Problems (by female group)

EXISTING PROBLEMS
1. Lack of water in the dry season
2. No water pump
3. Marketing problems
4. Lack of agricultural machines and tools
5. People leaving the village for work
6. No vocational training
7. Lack of vegetable seeds
8. Lack of farmland
9. Lack of welfare system

Information from Transects

On the second day, three villagers took the research team to look around the village. The first site the team visited was Mr.Prasert's farm plot where he runs a farm applying the integrated farming method. His six-rai farm plot has vegetable gardens, a small orchard and two fishponds with chicken houses built above them. He has now 930 chickens whose droppings automatically feed the fish in the pond. He earns 50,000 Baht annually by selling fish and another 80,000 Baht by selling eggs. He stated that the marketing is not a problem for his products as the town people are in need of such food items as eggs, fish, fruit and vegetables. Some other villagers have started similar farms and some people are interested in starting one after seeing Mr. Prasert's success. However, he stated that the initial investment cost of digging fishponds, building chicken houses, purchasing fish and chickens is high and this stops many farmers from following his example.

The research team walked through the village observing a pre-school, a primary school with a pond, small dairy farms, some village shops and villagers' houses. Most of the

houses have a garden with some vegetables, a variety of edible and medical plants and fruit trees (papaw, banana, etc.) where some chickens and ducks run around freely. The irrigation canal along the eastern side of the village is a narrow, earthen ditch with some water in it at the time of the team's visit. Along the ditch there were several small vegetable gardens and banana trees. Across the ditch there were several small bamboo or earthen crossings which lead to the rice field.

In the rice fields, the research team talked with some farmers who were busy harvesting rice. Some mentioned the high cost of agricultural inputs such as chemical fertilisers and insecticides, labour costs (100-150 Baht/day) and seeds; many of the villagers are permanent debtors of BAAC. They also said that the sale price of farm products is unstable and often determined by middlemen, leaving the farmers in a very weak position.

The village has a community forest of 23 rai and a cemetery forest of 3 rai. Deforestation was one of the problems mentioned during the focus group discussion. The forests are now protected under the village forest committee, which enforces some regulations. For example, the villagers can go to the forest and collect fire wood and forest products such as mushrooms, insects, bamboo shoots, edible plants, eggs, etc, but they need prior permission to collect wood or bamboo for house repair or construction. The committee can impose a fine on a person who violates the rule. Stealing wood 5m in length will cost the offender a fine of about 500 Baht.

(b) PRA Session in Ban Wiang Wai (21-22 November,1998)

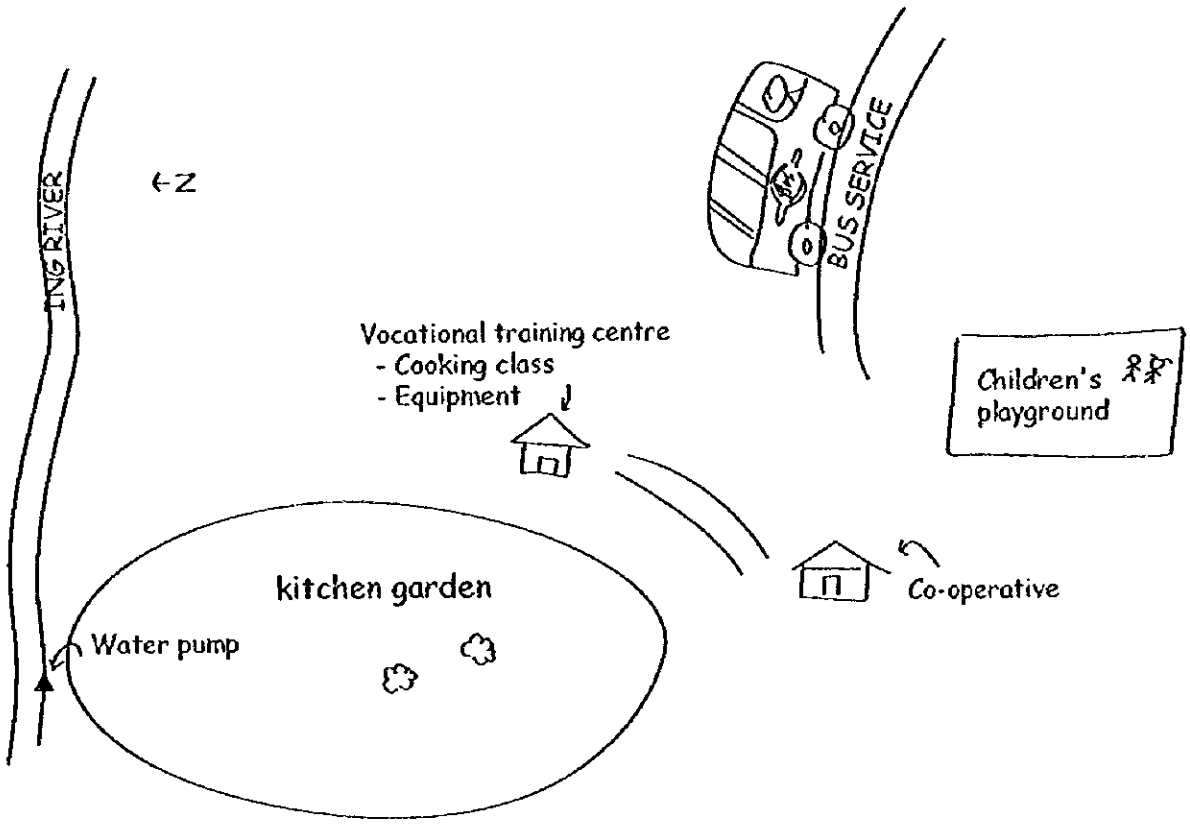
Introduction

The focus group meeting was arranged in the evening since it was the rice harvest period and the villagers were fully occupied during the day. By 7 p.m. 35 villagers (15 men and 20 women) gathered at the village temple, but some joined later and some left during the session. The facilitator greeted the villagers, introduced the research team and explained the objectives of the meeting to the villagers.

History and Problems in the Past

The facilitator asked the group to describe the history of the village. The following is the summary description. About 30 years ago, a group of around 50 families from Pa Kha Village of the current King Amphoe Khun Tal, Chiang Rai, moved to this area, which was then surrounded by dense forests and two rivers, the Ing River and Huai Khian. In those days people could obtain land, free of charge, by clearing the forest and the area close to the village. People lived in harmony. The forest and rivers provided them with plenty of food and other resources such as wild animals, mushrooms, bamboo shoots, a variety of edible plants, birds, insects, fish, firewood, etc. Some elderly people stated that life in those days was not easy due to dangers from wild animals such as tigers and bears, frequent flooding in the rainy season, no easy access to neighbouring villages, poor sanitary and medical standards and other conditions. The group made a list of past problems on a large sheet of paper (Figure 5.2.9).

FUTURE



Need

1. Water pump
2. Equipment used for their occupation
3. Vocational training centre
4. Kitchen garden
5. Bus service
6. Co-operative
7. Children's playground
8. Market

(by female group)

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	Figure 5.2.7. Nong Bua : Future Village Map
JAPAN INTERNATIONAL COOPERATION AGENCY	

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	**Figure 5.2.8. Nong Bua : Photographs of PRA Session**
JAPAN INTERNATIONAL COOPERATION AGENCY	

Figure 5.2.9. Wiang Wai: List of Past Problems

PROBLEMS IN THE PAST
1. No medical facilities (relying on medicinal plants)
2. Poor transportation (only walking or using an ox-cart)
3. No income
4. Theft of buffaloes, burglaries

When the facilitator asked the group about the changes of their life from those days, they acknowledged that their life had improved considerably. They recognised the major improvements in transportation (use of cars and motorcycles) and in sanitary conditions (clean drinking water from the village water supply system, use of toilets, etc.).

Then the group was divided into two groups for further discussions: one consisting of men and the other of women.

Present Conditions and Existing Problems

The facilitator asked the groups to draw a current village map (Figure 5.2.10). The map drawn by the male group was a macro view of the village, showing the village's land use and water sources (rivers and ponds). The map drawn by the female group, on the other hand, was more focused on villagers' everyday lives. Both groups discussed the problems they are currently facing and drew a list of existing problems, ranking each of the problems using grains of maize (Figures 5.2.11 and 5.2.12). Water shortage in the dry season was the most serious problem for both groups, and both groups stated that emerging social problems such as drug addiction and disintegration of families were serious and disturbing.

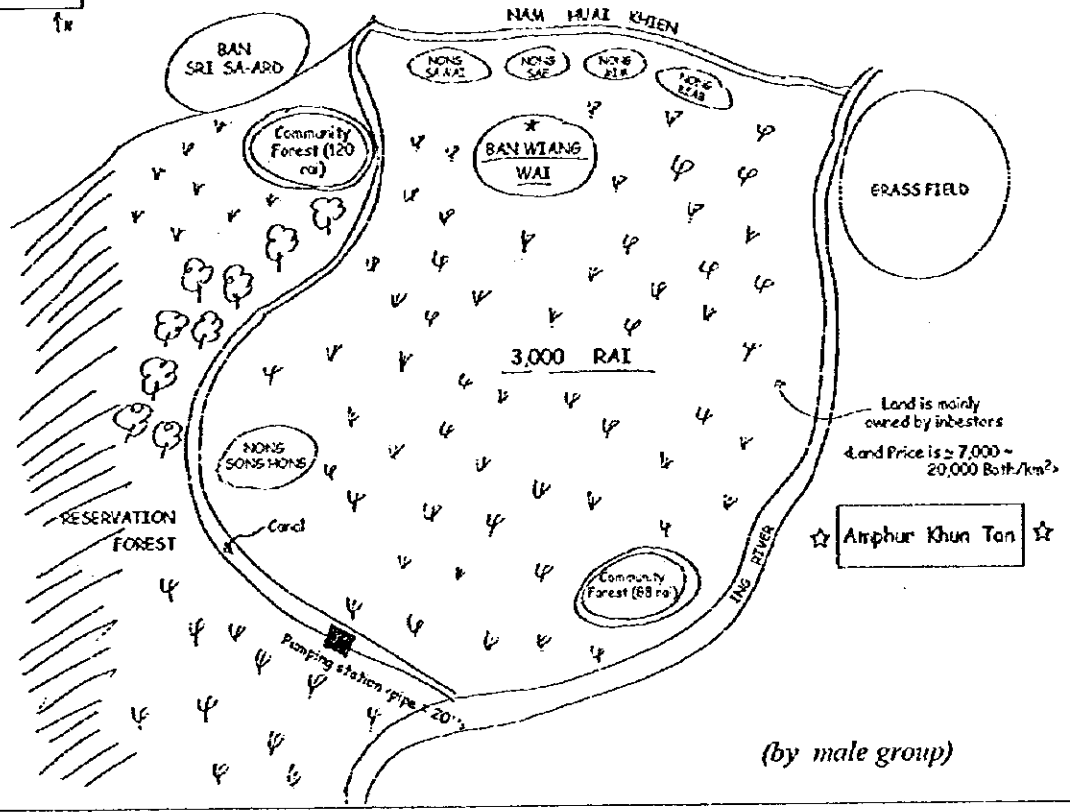
Needs for Community Improvement

The male group's discussion was focused on how to bring water from the Ing River to their farms in the dry season. They talked about the difficulty in pumping up water from the Ing River to the existing irrigation canal in the dry season due to the river's low water level. After some discussions they concluded that a weir should be built across the Ing River in order to raise the water level so that water would be pumped into the irrigation canal in the dry season.

The female group discussed the need for improving their community life, reflecting, but not limited to, the list of existing problems. First, they discussed the need for setting up income-generating programmes, especially for women, as a main or supplementary income source. Secondly, they suggested the need for improved infrastructure such as extending paved roads in the village, bringing in bus services which would connect neighbouring villages, a public telephone service, building a better drainage system along the road, and setting up of a Community Health Centre. They also discussed the need for upgrading the primary school to an extension school, which will also cover the first three years of secondary school, as well as improving the existing village reading centre, which currently only provides a daily newspaper, into a kind of village library.

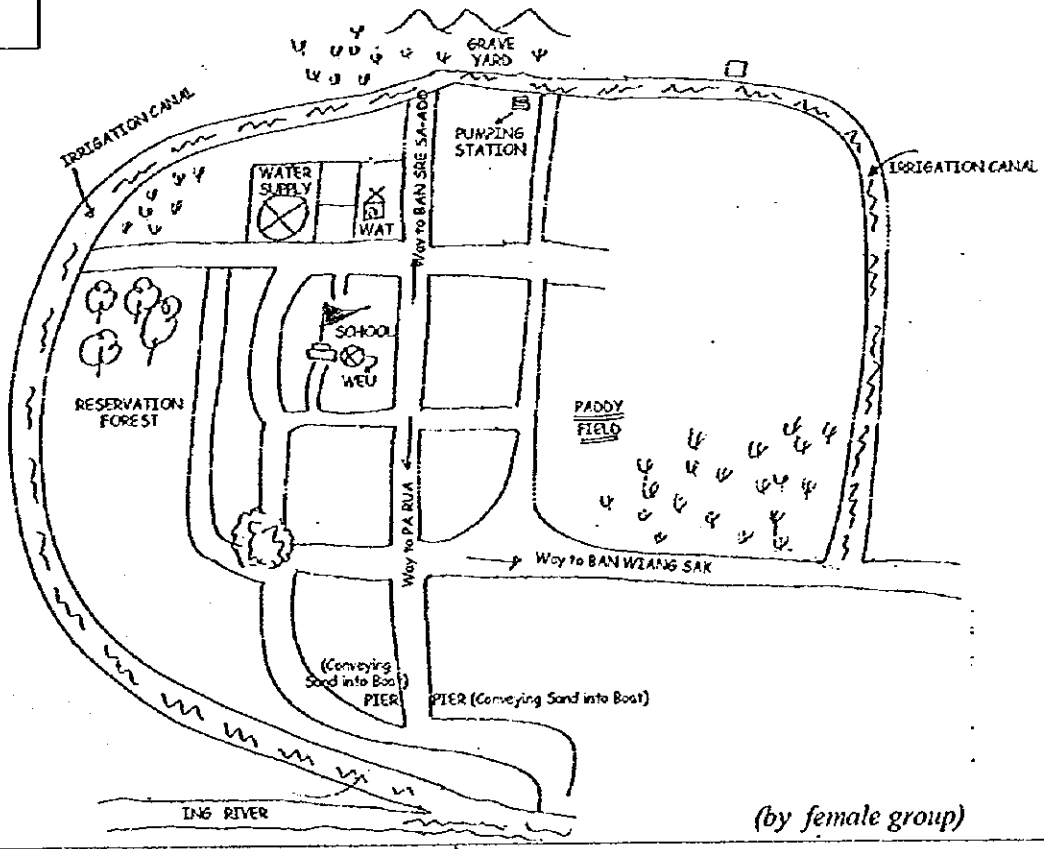
Photographs from the PRA session are shown in Figure 5.2.13.

PRESENT



(by male group)

PRESENT



(by female group)

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	**Figure 5.2.10. Wiang Wai : Present Village Maps**
JAPAN INTERNATIONAL COOPERATION AGENCY	

Figure 5.2.11. Wiang Wai: List of Existing Problems (by male group)

EXISTING PROBLEMS
1. Lack of water in the dry season
2. Flood in the rainy season
3. Drug addiction (amphetamine)
4. No job after harvesting / Young people working outside the area
5. Bad road
6. No bus service

Figure 5.2.12. Wiang Wai: List of Existing Problems (by female group)

EXISTING PROBLEMS
1. Drought / Lack of water in the dry season
2. Low price of maize
3. No paved road
4. Not enough income
5. Middleman determines low prices for agricultural products
6. No weir across the river
7. No public telephone
8. No work after harvesting
9. No vocational training
10. Infertile soil
11. No bus service
12. Drug addiction
13. No support group for women
14. No money for children's education
15. High cost of electricity for pumping water (dry season)

Information from Transects

On the second day, the research team walked through the village, starting from the village headman's house. The villagers who accompanied the team pointed out several empty houses whose occupants had left the village to work in town. One of the villagers told the team about his son who had left the village to work in town. Although his son permanently lives in town, he sends money every month to support the family and comes back to the village every year to help the family with the rice harvest.

On the bank of the Ing River, close to the village main road, sand dredging was taking place. The two workers on site told the team that they were from a construction company in Chiang Rai and the sand was for use in construction.

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	Figure 5.2.13. Wiang Wai : Photographs of PRA Session
JAPAN INTERNATIONAL COOPERATION AGENCY	

In the field near the river there were some buffaloes. The farmers harvesting rice in the field told the team the high cost of farm inputs such as chemical fertilisers and pesticides. They also mentioned problems of marketing farm products: a middleman usually determines the price and farmers have little control over the price. As many of the farmers are debtors of BAAC and the loans need to be repaid after the harvest to avoid higher interest, farmers usually end up selling the products at the price set by a middleman. One of the farmers suggested that the farmers should get together and negotiate the price with the middleman.

(c) PRA Session in Mai Don Kaew

Introduction

The focus group meeting was arranged in the evening at the village temple. By 7 o'clock in the evening, around 13 people (mainly women) were gathered at the temple. The village headman explained to the villagers and to the research team that some more people were coming, but they were late because of the boxing on the television. When around 20 people had gathered, the facilitator greeted the villagers, introduced the research team and the observers25 to the villagers and explained the purpose and procedure of the session.

Warming-up Session

The group was divided into two groups of mixed sex of around 15 people each. The assistant facilitator asked the groups to list the use of "pa kao ma", a traditional piece of cloth, which men often tie around the waist. Each group made a list of different uses of the cloth on a large sheet of paper. Then, each group read out the list to share the different uses, such as tying a baby on the back, wrapping a lunch-box, covering the head, wiping the table, using as a sheet and so on. The groups enjoyed sharing their innovative ideas. The facilitator explained to the villagers the importance of sharing ideas in a group and of discussing issues together, which would often lead to a better idea and conclusion.

History and Past Problems

The facilitator asked the groups to draw a village map of the past on a large sheet of paper (Figure 5.2.14). Then each group explained the map referring to life in those days. The following is the summary account of the village's history. Around 25 years ago, a group of villagers, who formerly lived in Ban Kiang Tai in the same sub-district, moved to this higher area because of the frequent flooding in the former village. Other people also moved to this area from Chiang Khom, Pam and Thoeng Districts in Chiang Rai. There was an old pagoda in the village when the first group of people moved to this area. In those days the villagers found lots of bamboo shoots and other edible plants and insects in the forest as well as lots of fish in the two streams, Huai Nam Ring and Nam Rong Tat. They grew paddy in the rainy season for self-consumption. Roads in those days were very rough and muddy and the villagers had only mules and ox-carts as means of transport. People also suffered form malaria and other diseases.

[25] Unlike other PRA sessions, several officials were present to observe the session: two officials from RID, one official from OEPP and one member of the Project Advisory Committee from JICA.

Existing Problems

The facilitator, then, asked the groups to draw a village map of present conditions (Figure 5.2.14). After drawing the map, each group described the current conditions of the village using the map. They talked about the Rice Bank, a credit system of rice and money, which started 6 years ago from with government funding. The government funded building of a rice-store and gave 2.5 ton of rice to start the system. In the beginning, those who borrowed rice had to repay twice as much within a certain period of time. The interest, however, has now been reduced to 30 %. The bank currently has 16 tons of rice and the village decided recently to use some of the asset for the restoration of the temple. They also talked about the school, which is situated at the centre of the village and has good facilities as well as a good access to even those who come from other villages.

They also discussed some of the problems they were currently facing: water shortages in the dry season (for drinking, domestic and agricultural use); no market for farm products in the village; insufficient income due to the lack of job opportunities after the rice harvest; out-migration of young people to find work in town; inadequate road system between the fields and the main road; etc.

Needs for Community Improvement

The facilitator gave small pieces of paper to one group. Individually villagers wrote down the needs of the village on the paper, which were later collected and categorised. The need for water for farming as well as drinking and domestic use, and the need for job opportunities during the off-farm periods were the two main issues.

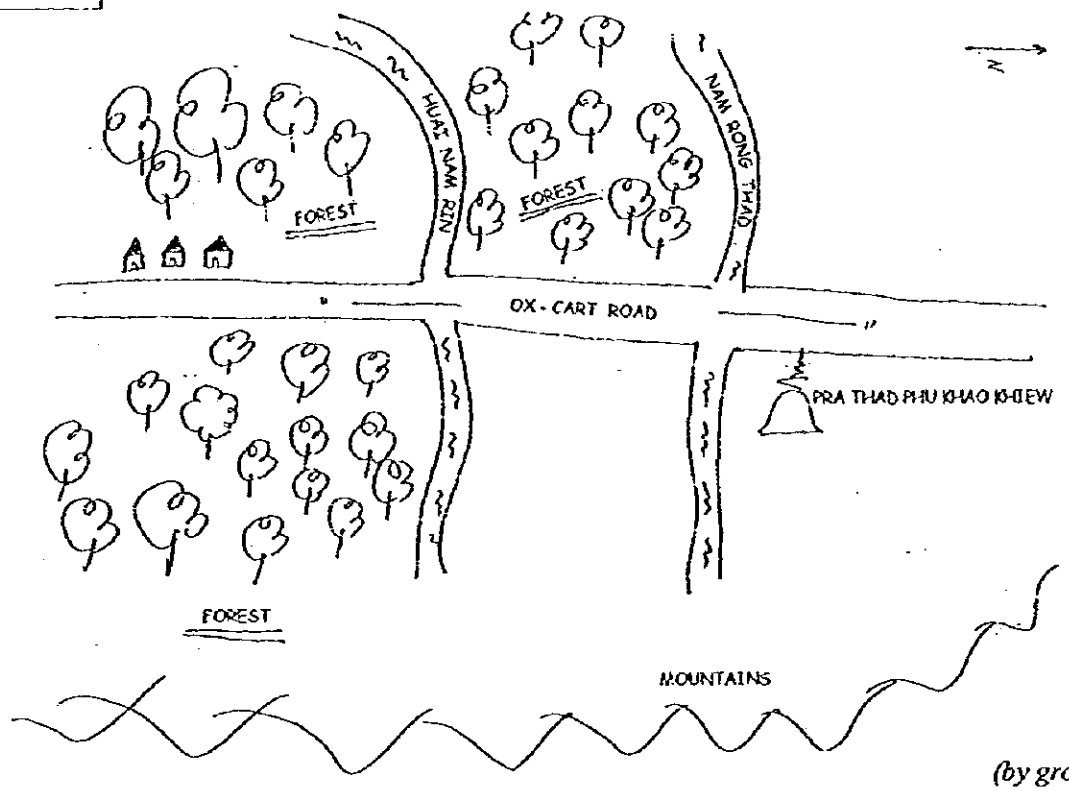
The second group was asked to draw a map of the future / desired village (Figure5.2.15). The group then explained their needs described in the map. They map shows a four lane road with irrigation ditches along both sides of the road, paved "soi" (small roads off the main road), irrigation ponds surrounded by vegetable gardens and trees, a factory, a market for farm products and a village water supply system.

The groups continued to discuss how to solve the problems and improve their community life. After some discussion, the following conclusions were made.

1. In order to supply irrigation water, they will build a 25-km long irrigation canal from the location of Ban Mae Tam, a upstream on the banks of the Ing River. The canal will pass through 4 villages before it reaches Mai Don Kaew. The village will investigate the SIF scheme and apply for project funding.
2. In order to secure enough drinking and domestic water, they will drill three more boreholes.
3. They will seek income-generating programmes as a supplemental income source during the off-farm season.
4. They will apply for funds from the local authority and improve the road system between the paddy fields and the main road.

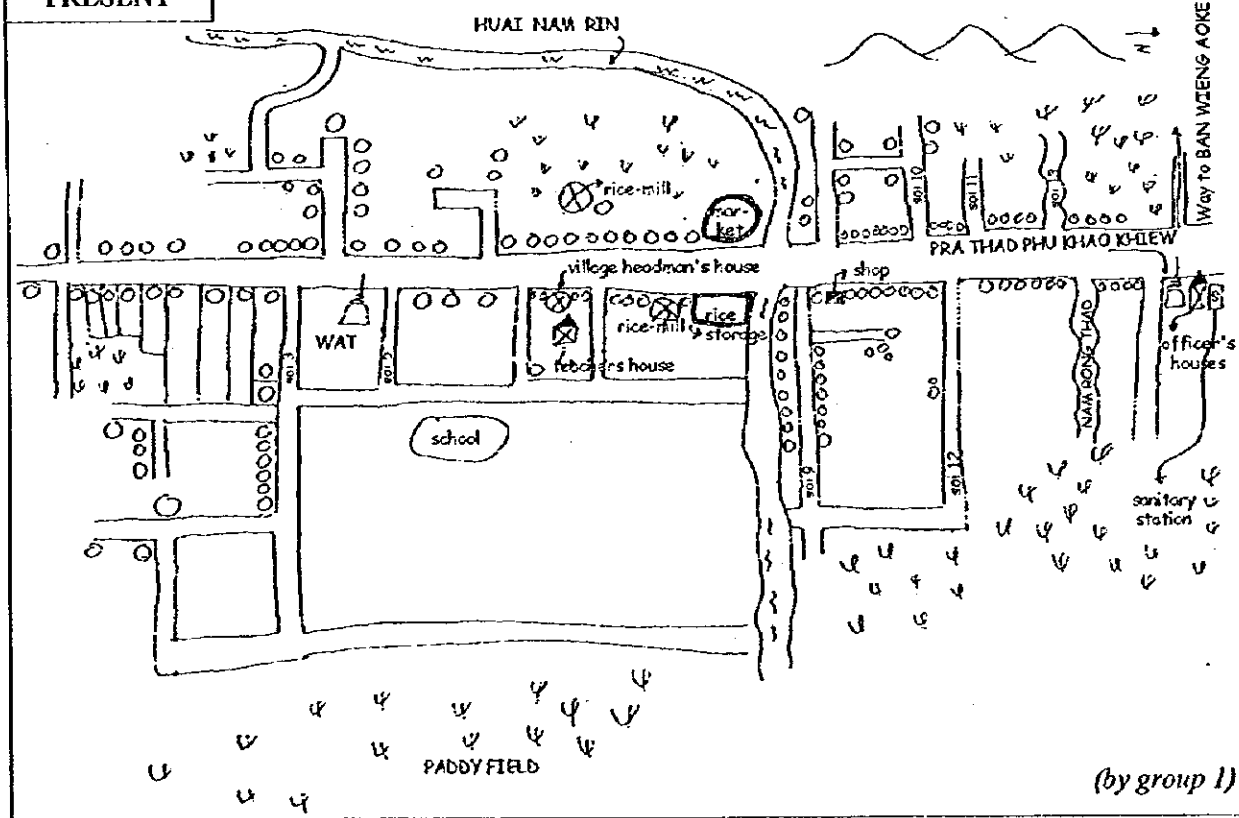
Photos of the PRA session are shown in Figure 5.2.16.

PAST



(by group 2)

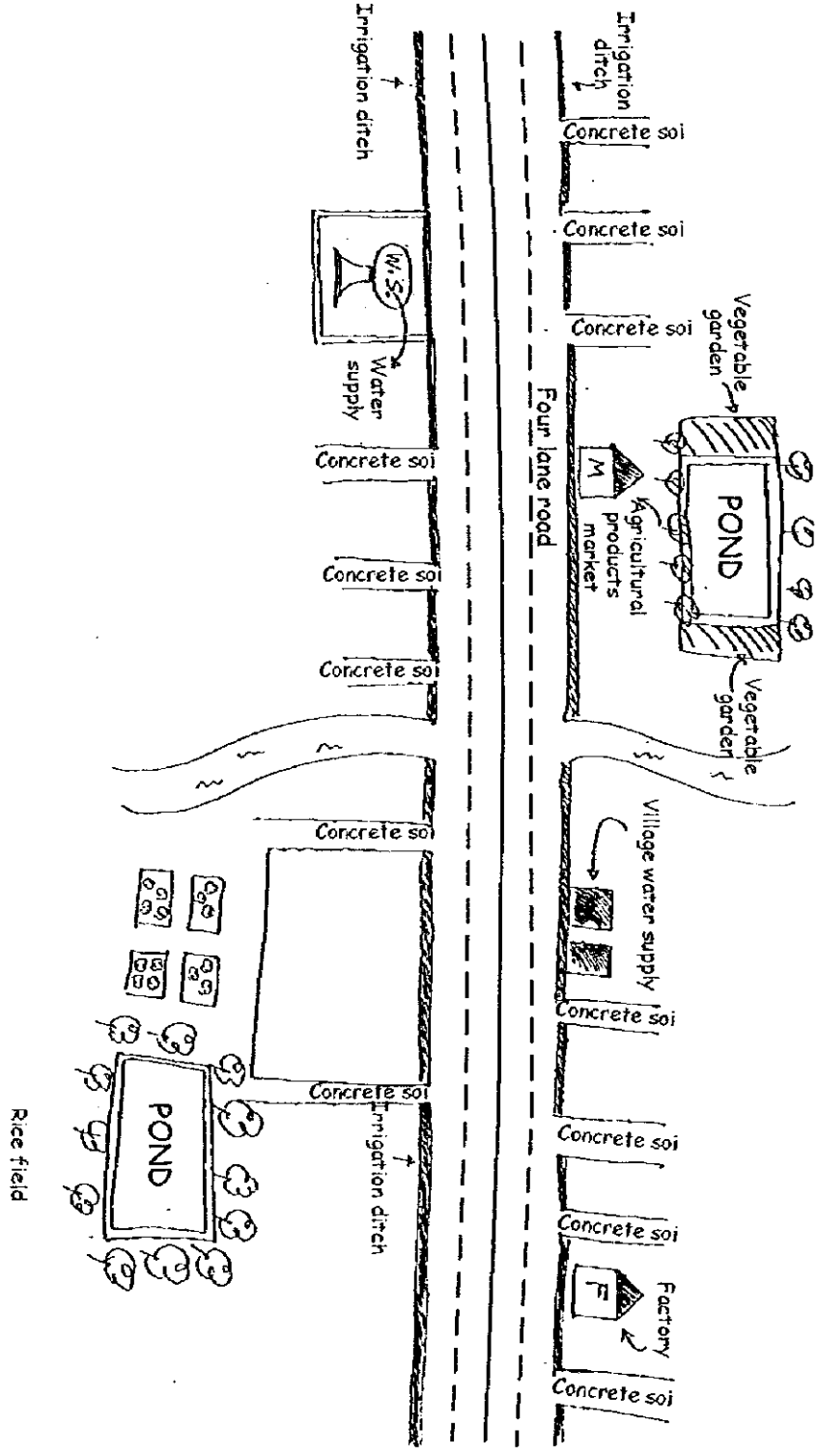
PRESENT



(by group 1)

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY	**Figure 5.2.14. Mai Don Kaew : Past and Present Village Maps**

FUTURE



ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	Figure 5.2.15. Mai Don Kaew : Future Village Map
JAPAN INTERNATIONAL COOPERATION AGENCY	

ENVIRONMENTAL STUDY THE KOK-ING-NAN WATER DIVERSION PROJECT	**Figure 5.2.16. Mai Don Kaew: Photographs of PRA Session**
JAPAN INTERNATIONAL COOPERATION AGENCY	

Information from Transects

The village headman took the research team to look around the village. The first site was a new weir across the Huai Nam Rin, one of the two streams flowing through the village. According to the village headman, the fund from the local authority (tambon council) was used to dredge the stream and to build five weirs across the stream two years ago, in order to prevent the areas adjacent to the stream from flooding in the rainy season. However, the two streams, Huai Nam Rin and Huai Rong Tat do not have enough water to support dry season farming.

Along the road, the research team came across two women making fishing nets under the tree. They said that it takes between 10 days and 1 month, depending on the time available, to complete a fishing net, which they can sell for 600 Baht. The team also observed villagers using the water from a public well. According to the villager, the water from the deep well at the school is the only safe water to drink. The water from the other wells can be used for domestic use but not for drinking.

The village headman then took the team to his own pig farm and fishponds. Five years ago, he started a pig farm in part of his 8-rai-longan-orchard. He currently keeps 42 pigs, which generates around 400,000 Baht annually. Close to the pig farm he also constructed 4 fishponds, in which he has several hundred fish and stores water for the farm. The fish farm is also successful and has become a stable income source. He is one of a few families who are applying the integrated farming system relying on the own resources. He mentioned that after seeing his and others' success, some villagers already started similar farms.

The last site that the team visited was a well-established secondary school near the village temple. Some of the teachers showed the team around the school and provided the team with some information on the school. Until 1987 the village had only a primary school and it was recognised as one of the reasons why few children continued education after completing primary school. When the Ministry of Education announced the possibility of establishing a secondary school in this village, the village welcomed the idea and formed a committee to accelerate the plan. The committee allocated suitable land for the school and started building temporary classrooms with wood collected from the forest while waiting for government funds. The school currently has 31 teachers and 982 students, most of whom are students from other villages. In addition to the main school buildings, the school has boarding facilities for the students from far villages. The school provides the boarding students with practical training such as cultivating vegetables and mushrooms, and raising chickens, ducks, fish, frogs, etc. The school also provides the villagers with a weaving course.

(8) Recommendations for Sustainable Rural Development

The interview survey was conducted in only six villages out of over two hundred villages downstream of the proposed Ing diversion weir. It is not possible, nor was it intended, to claim that these sample villages represent the whole of the sub-basin. Nevertheless, the survey results, together with PRA sessions, clearly indicate an overview of socio-economic conditions of the area and primary factors impeding development.

PRA sessions conducted in the three sample villages should be seen as case studies, as each village has its own unique history as well as geographical, social and economic conditions, which present different challenges to the villagers. PRA was applied to present an alternative approach of community development, in which the local people are recognised as the main actors in their development process. PRA is a method of promoting people's participation and indigenous knowledge

in the process of community development. It is necessary to accelerate sustainable rural development in the donor basins prior to the Kok-Ing-Nan Project. In this context, wider application of PRA in donor basin communities will benefit for the formulation of sustainable rural development projects.

The findings from the survey, especially from the PRA sessions, indicate some priority areas for future rural development. Though each village has its own priority and suitable ways of realisation, the following common areas were found important for the future development of communities in the donor basin:

- **Water Resource and Irrigation Development**
  Most of the villages have a severe problem of water shortages in the dry season. In some villages even the supply of drinking water poses a problem in the dry season. The provision of safe drinking water throughout the year needs to be addressed urgently. Very little farming is currently practised in this area during the dry season due to the lack of water. Even in the villages relatively close to the Ing River, water cannot be supplied due to the low water level. Small-scale irrigation projects, which assure the supply of irrigation water to the farmers in the dry season, would improve the socio-economic conditions of the area. There are different methods of supplying irrigation water depending on the local conditions. However, construction of weirs across the streams and rivers to raise the water level, and installation of pumping stations to pump up the water into irrigation canals are potentially beneficial for the further agricultural development of the area.

- **Agricultural Diversification**
  In order to achieve sustainable agricultural development, agro-forestry and integrated farming and aquaculture should be further promoted. In the surveyed villages it was found that some farmers are currently engaged in agricultural diversification including dairy farms, aquaculture, together with poultry or animal husbandry, orchards, etc. For such a diversification process, farmers need an initial investment as well as a means of supporting themselves until any benefit accrues (especially fruit trees, aquaculture and animal husbandry). Provision of credit services or a farmers' support fund, for instance, from the proposed Donor Basin Sustainable Development Fund (DBSDF) will benefit farmers.

- **Improving Quality of Life**
  Social problems such as drug addiction among youths, out-migration of the younger generation in search of work, AIDS-infected villagers, etc. were pointed out during PRA sessions as well as in conversations with village heads and villagers. Such social problems are often the result of depressed economic conditions and limited employment opportunities in the area. The introduction of agro-industry and promotion of cottage industries using locally available resources will provide employment opportunities for the villagers, especially after the rice harvest season. Measures to support farmers, women and youths by providing facilities and amenities should be considered in order to improve their quality of life. Such projects might be funded by World Bank's Social Investment Fund (SIF) or through the proposed DBSDF.

- **Conservation and Rehabilitation of Natural Resources**
  In all the surveyed villages, it is acknowledged that the degradation of community forest is serious. Due to increased population and expansion of farmland, forests have been reduced and degraded severely in recent decades. In most cases villagers are aware of the consequences of forest destruction. At present most villages have a forest management committee which exercises some degree of forest management. Further promotion of forest conservation and rehabilitation, with an emphasis on community forestry, will support sustainable development of the area. During the field survey the research team noted that many of the houses are surrounded by a small, but diverse garden with variety of fruit, vegetables, edible and medicinal plants, bamboo, chickens, etc.. The importance of such natural resources and local wisdom of

its usage should be promoted further, together with forestry programmes, especially with the younger generations.

- **Upgrading Rural Infrastructure**
  During the PRA session when comparing life in the past and present, the villagers noted significant improvements made to the infrastructure and facilities in and around the village. However, further improvement of infrastructure was discussed by the villagers, including rural water supply systems, construction of irrigation canals, construction of dikes for flood protection, road improvement, etc.