

APPENDIX H

Rural Sociology / Operation and Maintenance of Facilities

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H.1 Rural Sociology

H.1.1 Demography

Though there is not an accurate demographic datum of the study area, the study team tried its best to collect the newest data through the planning office, Department of Agriculture in the five provinces. Referring to the data (Table H.1), the total population in the five provinces is 4,376,631 and if it is limited only in the study area, the population is 3,242,609 in which KRATIE has 96,164, KAMPONG CHAM 1,137,601, PREY VENG 878,630, KANDAL 907,813, TAKEO 222,401, it varies greatly in provinces.

Popular density differs greatly from a province to another, from 38 persons/km² in Kratie to 265/km² in Takeo. The whole average of popular density is 187 persons/km² in the study area (Table H.1).

Women ratio to the whole population in the study area is 52.3%, ranging from 50.8% in Kratie to 52.7% in Kandal (Table H.1). The ratio becomes higher in the provinces near the capital. The socio-economic survey in this study reveals that women ratio to the total population is 51.2% that seems normal, and women over 30 years old are 52.7%.

A family size is rather constant between 5.8 members in Kratie and 5.2 in Prey Veng and the average is 5.4 persons in a family, showing that the family size is rather small. But the socio-economic survey shows 6.6 persons in a household. A distribution by ages denotes the thirties are extremely fewer than the forties and twenties, the baby boomers are teen agers and births are decreasing now (Fig. H.1). The thirties are probably the most effected generation by the wars directly or indirectly. The tendency is the same not only in the total population but also in each province. The children under 15 of age are 37.9% of the total.

H.1.2 Local Administration

(1) Structure of administration

Local administration in Cambodia is structured in an order as follows:

- ① Province (Khet)
- ② District (Srok)
- ③ Commune (Khum)
- ④ Village (Phum)
- ⑤ Group (Khrom)

There are administrative offices down to the level of commune, implying that the commune

is the lowest unit of administration. Each unit of local government has an appointed chief of administration. A governor of district, a chief of commune and a village chief are paid but a chief of group is not paid, district governor 41,000 riels a month, commune chief 30,000 riels and village chief 11,000 riels. The province has a system of tax collection i.e. yearly revenue though it is very small to its requirements.

The study area includes five provinces as KRATIE, KAMPONG CHAM, PREY VENG, KANDAL and TAKEO. Each province has 5 to 16 districts (Table H.2). Number of communes and villages under a district varies greatly from 6 to 23 communes, from 19 to 323 villages.

(2) District (Srok)

A district has sections of District, Planning & Statistics, Accounting, Police & Military police, Agriculture, Education, Public works, Rural Development, Information, Culture & Art, Transportation & Post, Land, Health & Dispensary, and Business. There is not a district council. The district governor is responsible to convey the national policies to the commune chiefs, decides a development plan in the district and keeps security of rural life. The district holds District Rural Development Committee (DRDC), composed of the governor, his deputy, and chief of sections, though many districts are under a process of forming the committee. The committee meets once a month usually.

The deputy governor of Kean Svay District, Kandal tells that there are 12 communes and 44 villages under the district. It has all the offices as mentioned above and a government bank (Kean Svay Bank) to offer credits to any people in the district. There is a tax office in the compound of the district which is a branch office of provincial tax office and the collected tax totally goes to the province. There are 25 staffs in the district office, 211 seconded staffs from the province and 128 police men and military police. The governor receives 41,000 riels a month and the deputy 35,000 riels a month.

(3) Commune (Khum)

The commune is consisted of several to dozen of villages and the size varies from small to big, depending on its popular density. The commune chief (Mekhum) tries to maintain security in the Commune, meditates disputes between villagers which a village chief can not solve, conveys the national policies to village chiefs instructed by district governor. A commune usually holds an office of the commune attended by several commune workers. A commune has offices of agriculture, education, and a health center where a medical assistant, nurse and/or traditional birth attendant work.

According to a hearing from a commune chief of Choeurng Tek Commune, Kampong Leav District, Prey Veng Province, five villages belong to the Commune which holds 1,015 families and 4,833 persons, 2,312 men and 2,521 women among them. In the Commune, there is only one Buddhist temple. The commune has no ways to find the revenue other than the district office, and when there is a public work, materials are provided by the district office. There is not a council nor the sort, but the five village chiefs meet once a month at the commune office. The chief thinks the function of a chief to fill the duty from district, take care of agriculture, culture, security, health and social affairs of the people, and solve the disputes between villagers. The chief was appointed in 1983 through an election held only one time in the past and has been a commune chief for 13 years since then. He receives 30,000 riels per month from the district while his deputy receives 27,000 riels monthly.

(4) Village (Phum)

A village is consisted of more than 100 households though the number of houses differ from a village to another. It is headed by a village chief (Mephum) who is responsible for all the aspects of villagers' life, from meditating disputes among villagers to a communication of the national policies. A village has not its office.

A hearsay by a chief of Roka Krom Village, Sambomash Commune, Kampong Cham District, Kampong Cham Province describes that the village is sub-organized with 10 groups (Khroms), five groups of ethnic Cham and other five groups of buddhist Khmer, populated with 2,387 persons in 376 families, 145 islamic families and 231 buddhist families, 1,137 men and 1,250 women (ratio 48:52), 1,094 persons under 16 years of age (45.8% of total population). There are no conflicts between buddhists and islams in the village. There is an islamic mosque in the village, but a buddhist temple exists outside the village where the same commune people get together. The chief deems clearly the function of a village chief security and statistics of demography. He was appointed as the chief in 1991 after quitting from police and thinks by himself that he was appointed because he was popular among villagers, a long habitant of the village since 1969 after he was married with his wife, born in the village, and the former village chief was not a native of the village. Villagers do not move in nor out of the village these days except the election time in 1993, when many fled away of security reason. He is paid 11,000 riels monthly by the district.

(5) Group (Khrom)

A group (Khrom) is a remnant of Khrom Samaki which practiced a collective farming under the Hen Samrin regime in the early eighties. Khrom is a group of houses whose head is

called Group chief (Mekhrom). The Group chief represents the members when required. He is not paid but responsible for the group security. The Group members are often related in a sib, while village members are sometimes related more loosely than the Group.

H.1.3 Community in the Study Area

(1) Rural socio-economic survey

A rural socio-economic survey was carried out on 1,000 households in the study as originally designed, 600 farmers along the rivers, 300 farmers away from the rivers, and 100 fishermen. The fishermen are the people who earn their living dominantly from fishing. The interviewees were set to be always the fifth house from an end of a village for a random sampling, distributing evenly throughout the study area. The interviewees were selected in the target districts as evenly as possible in order to represent the area well and they were distributed to the provinces as follows:

	Total households	Farmers	Fishermen
KRATIE	38 (38)*	34 (34)	4 (4)
KAMPONG CHAM	272 (239)	249 (216)	23 (23)
PREY VENG	289 (79)	258 (70)	31 (9)
KANDAL	362 (316)	326 (280)	36 (36)
<u>TAKEO</u>	<u>39 (0)</u>	<u>33 (0)</u>	<u>6 (0)</u>
Total	1,000 (672)	900 (600)	100 (72)

* Figures in the brackets show numbers of households interviewed along the rivers.

The questionnaire covered wide range of questions, totally 55 items on rural society, household, agriculture, animal, and fishery. The questionnaire is attached in Annex H.1. The results of survey are described here and there at the related sections.

(2) Rural society

A village is an aggregate of houses which is usually located at a higher place or an artificially mounded area near the road or dike. The paddy fields are separated from the residence, they are far away from the houses and are run as a commuting farm where farmers and their families work, eat, and sometimes sleep when they are very busy in the fields. They put usually up a temporary hut by the farm, which is burnt out when a harvest is finished. Since the study is targeted on the flooded area of the rivers, it is physically difficult to build houses in or near the paddy fields. The long distance from the residence to the field undoubtedly causes inefficient farming and farmers have

less chances to keep their eyes on what is happening in the fields. On the other hand, a village aggregated with houses in a place facilitates more intimate social intercourse among villagers, easier communication, and better security against bandits as well. A house is often surrounded with a hedge.

The residence area is found very easily at a far distance where trees are planted intensively, i.e., ever green throughout a year, giving shade, tranquility, and fruits to villagers. The Cambodian country is characterised with a palmyra palm, *Borassus flabellifer* L. which people here mistakenly call it a sugar palm. Because the palm produces good sugar from its toddy. The palms are found more on the ridges of paddy fields. The trees surrounding houses are mainly fruit trees of mango (*Mangifera indica* L.), Indian jujube (*Zyzyphus mauritiana* LAM.), coconut palm (*Cocos nucifera* L.), banana (*Musa* sp.), Puneala plum (*Flacourtia jangomas* REAUSCH.), Manila tamrind (*Pithecellobium dulce* BENTH.), tamarind (*Tamaridus indica* L.), star apple (*Chrysophyllum cainito* L.), custard apple (*Annona squamosa* L.), star berry (*Cicca acida* MERR.) and/or Betel nut palm (*Areca catechu* L.). Sometimes useful plants are found near houses as vegetable humming bird (*Sesbania grandiflora* DESV.) and rain tree (*Samanea saman* MERRILL). Vegetables are rarely found in the home gardens. Therefore, fruits play an important roll to provide villagers and especilly children with vitamins.

Life in the flooded areas changes drastically in wet season, compared with dry season. Water floods anywhere, it looks like the sea. The main transportation is a boat on the water often without engine. Many people go fishing to the water where it was rice fields in dry season. Farmers with the lands in non-flooded areas are busy in transplanting rice in rainy season. Many farmers hold the lands both in the flooded area and in the non-flooded area. Because their residences are located at higher places where the water does not reach. The fields in the flooded area are run as a commuting farming, and they are used for dry season cropping, so called 'recession rice' in which rice is grown with the receding water according to the lowering of the Mekong water level. The farmers finish harvest just before the water comes into the fields. It is the usual scene that many farmers are threshing rice on the dike or higher mounds at the end of dry season. They often carry the harvest on boat to their houses with the increasing water.

The rain deteriorates unpaved village roads. As there are many puddles on the roads anywhere, people meet difficulty to move on the muddy roads in wet season. Thus a water transportation becomes much easier way of movement, provided that one holds a boat. Sometimes the water takes away an access from children going to school. The rain also deteriorates sanitary conditions of the villages. Water is stagnant anywhere and the paths in the villages are all muddy. Usually no sewage channels exist in the villages. Most of villages are full of rotten water that causes diarrheal diseases. Life in wet

season looks more unsanitary than one in dry season. On the other hand, where there is a water canal, wet season brings fresh water into villages that provides children with swimming pools and people with fishing lots.

The source of drinking water is affected largely from the locations of the houses, because the study team surveyed the households near the rivers and away from the rivers. Those near the rivers fetch drinking water from the rivers and others away from the rivers get water from the wells mainly. And both of the houses use water from the rainfall. Totally out of 1,000 households, 475 of them use water from the rivers, 420 from the rainfall, 335 from the wells, 159 from the tube-wells, and 89 from the ponds and the reservoirs. Three households buy water from vendors.

Nearly all of the 1,000 families in the survey use firewood for cooking except one family using cooking gas. In addition to firewood, 6 families use charcoal, and 7 families use rice husk or straw. Thus, firewood gathering is an important work in the rural area, firewoods are piled for sale at the road sides, and giving a chance of non-agricultural income to farmers. On the other hand, it has destroyed the flood forest tremendously.

Exactly two thirds of farmers do not practice mutual help of farming, but 29% of farmers practice it (Socio-economic survey).

(3) Family

A family is averagely consisted of a bit more than 5 members (average 5.4), ranging from 4.1 to 6.2 members (Table H.1). It implies that many families here are nuclear families, probably because a community and family were completely destroyed by the Pol Pot regime and reformed again later. A householder is usually husband who holds a strong power in the family, but wife usually keeps home economy, holding the purse of the family. Whenever there is a village meeting, husband attends it and wife is satisfied with it undoubtedly that social matters are in the hands of husband. It is reported that approximately one third households are headed by widows in Cambodia of long run wars.

A woman leads a busy life in the rural area. Women in farmers' families averagely work for 10 hours 8 minutes in a day, 1hr 58min for cooking, 1hr 2min for child care, 29min for fetching water, 40min for cleaning house, 43min for washing clothes, 4hr 49min for farming, 21min for cottage industry, and 6min for the others. Compared with it, women in fishermen's families work for 9 hours 4 minutes a day (Socio-economic survey).

(4) Education

Literacy rate over 16 years old is 83.5% averagely, women 76.3% and men 91.3% (Socio-economic survey). But another report says that literacy rate over 15 years old is 62.4% averagely, women 43.1% and men 89.6%, attendance rate to school under 15 years old are 64% averagely, girls 54% and boys 72%, and years in schools are 2.8 years averagely, women 1.9 years and men 4.2 years (Rural Development & Resettlement Project, 1994).

Basic education in Cambodia is 5-3-3 system, 5 years in primary school, 3 years in secondary school and 3 years in high school, totally 11 years before entering into higher education. But it was improved to 6-3-3 system in September, 1996, totally 12 years before higher education.

There are 190 primary schools in Kratie province, 656 in Kampong Cham province, 459 in Prey Veng province, 382 in Kandal province and 330 in Takeo province (Table H.3). Averagely there exist three to four primary schools in a commune and one school in about three villages. A primary school is found very often in the compound of buddhist temple. A school has 6 to 7 rooms averagely but many schools suffer from lack of class rooms (Table H.3). Teachers are more than class rooms, exposing that many schools undertake double shift education in highly densed areas. There are about 390 pupils in a school averagely. Many school buildings have dilapidated and need rehabilitation or reconstruction work. Several foreign donors have been assisting in the works if not enough.

Secondary and high schools are much less to primary schools, one secondary to 8 - 21 primary schools, and one high school to 35 - 95 primary schools and 3 - 6 secondary schools. Many students fail in the certificate exam at the end of their learnings and remain in the school. It is heard that only 10% of the graduates pass the exam.

A primary school has 4.3 classrooms averagely in Kratie province, 5.9 in Kampong Cham province, 6.6 in Prey Veng province, 7.5 in Kandal province, 8.5 in Takeo province, and 6.6 rooms averagely in 5 provinces. Departments of Education in the provinces need more classrooms in primary education (Table H.3). For example, Prey Veng needs 3,768 rooms, kandal 277 rooms, and Takeo 3,361 rooms. The biggest reason is the increase by one year of changing the education system.

Number of students in a room varies from 53 to 66 students in primary schools, from 23 to 47 students in secondary schools, and from 28 to 67 students in high schools. A teacher teaches from 43 to 53 students averagely in primary schools (Table H.3). Girls occupy 42.5% to 45.0% in primary schools, 25.5% to 38.6% in secondary schools, and 28.8%

to 37.7% in high schools, and it may be analysed that the higher is the education, the fewer are girls in the schools. In other words, one of three students or one of four are girls in secondary or high schools. Drop-out rates show rather small from 1.6% to 3.2% in primary schools, but there are many repeaters, though they are not in the table. According to a report in 1994, repetition rates in primary schools are 40% in 1st grade, 29% in 2nd grade, 23% in 3rd grade, 18% in 4th grade, and 18% in 5th grade. It explains that quality of education should be improved together with physical facilities. There is a new movement in primary education which is called a formation of cluster schools in order to share scarce resources more effectively, help isolated schools, and mobilize community motivation. A cluster school has 2 to 10 schools, and 5 to 6 schools averagely. In Takeo Province, 330 schools are grouped into 52 clusters. UNESCO and USAID help the movement.

(5) Hospitals

There are one to four provincial hospitals in a province, a district hospital in a district 11 districts, and nearly one health center in a commune in principle (Table H.4). When a person gets sick in the rural area, the health center is the first point to reach.

Many health centers at communes are not in good conditions, most of them need rehabilitation or reconstruction, 44.8% of health centers need rehabilitation, and 43.9% need new construction (Table H.4). The total number of health centers is reducing because the Department of Health at provinces tries grouping health centers into referral hospitals in order to share resources and make them effective. Other than those physical facilities, the departments meet many problems such as low quality of medical staff, deficit of budget, low salary and irregular payment, insufficient equipments and medicines, and scarce office supplies. Serious diseases are tuberculosis, malaria, diarrhea, acute respiratory infection, malnutrition, etc. Many international NGOs have been assisting in medical fields in the study area as well as WHO and UNICEF. The national programs cover wide range of works on tuberculosis, malaria, dengue fever, mother and child care, birth spacing, infectious respiratory affection, nutrition, primary health care, sanitation, food hygiene, expanded program of immunization, and laboratory.

(6) Religion

In Cambodia, Buddhism is the largest religion except a few people believing in Islam or Christianity. There are 1,629 buddhist temples in the five provinces, 82 mosques and 21 sub-mosques, 39 churches, 6 Chinese buddhist temples and 7 Vietnamese buddhist temples in the study area (Table H.5). There are two to four temples in a commune and a monk to 270 persons.

Buddhism in Cambodia belongs to Theravada in which the believers read the texts in Pali. The monks follow strictly the buddhist commandments such as no food after the noon, practicing mendicancy, not marrying a woman, not even a direct contact with a woman, etc. in that people are fully confident on their belief. It may be said through observations that Cambodians are very religious.

A temple is a center of mental life in the country. It is clear that a reconstruction of a village anywhere in Cambodia started with reconstruction of temples. You can see many temples under construction or newly completed beautiful temples elsewhere. A temple has a sacred pond that only monks can take a bath and people get drinking water from the pond. It is a comparatively large pond, surrounded by trees, clean, calm and tranquil. A temple is often attached with primary school of the community, because a temple has a temple construction committee, composed of temple caretakers (Achar) from villages. Achar is a selected elder of experiences and Pali knowledge. The committee also takes care of village infrastructures as primary school, village roads, community ponds, etc. Monks and achars, therefore, have influences on village development to some extent.

A temple is the place where religious rites are practiced. Most of the people feel very happy to attend the temple on occasions with families, carrying lunch boxes to bring food to monks and later people eat it together. A big temple is with a minaret of incineration where the corps are burnt. The bones are laid in the stupa in the compound. Thus, a temple is very important to people.

(7) Electricity

Among 1,000 households, more than half of them, 529 houses have no ways to enjoy electricity at all and most of them use oil lamps in stead. Car batteries as electricity source are used in 206 houses, small generators as groups merely in 15 houses, and personal generator only in one house. Electricity from the power line reaches 40 houses in 1,000, but the places having access to electricity are scattered strangely here and there in 10 districts in the study area. It may suggest that electicity is generated privately in a small scale, and delivered to the houses through the lines as a group generator system.

(8) Rural communication

It is hard to communicate information to rural areas. The available ways are to ask your friends to carry your message or a radio which is so limited in use. There are post offices in the capital of provinces but they are not frequently used. A communication through telephones is not possible except Thakhmau which is within the reach of Phnom

Penh. The communication of information in rural areas are poor and a sure way of communication is needed for rural development and for dissemination of new technology.

II.1.4 Women in Rural Area

The Demographic data of this study show that 52.3% of the total population in the study area are women, though 51.2% in the socio-economic study. UNICEF describes in 1996 that 53.4% of adults over 18 years old are women. It is shocking that 65% of all people are women particularly between the ages of 35 and 40 (HALCROW, 1994). Thousands of men died in the wars and many widows are left to earn day-to-day needs of their families. Many reports describe that approximately one third of families are headed by women in Cambodia at present, but UNICEF says that 20 percent of households are female headed. And such households are much more in the state of destitution than male headed families.

(1) Women in Rural Society

Women are busy. The socio-economic survey in this study on 900 farmers in the five provinces reveals that they work for 10.14 hours a day averagely. They have to clean the house, wash clothes, fetch water and firewood, cook food, take care of children and work in the paddy fields. And usually a wife keeps money of the family. According to the research on 3 communities done by J. Ledgerwood (1992), a wife holds all the money of the family in 92.6% of households. It may be a tradition of Cambodia, but a woman is more tightfisted than a man actually, and it is found through my personal experiences in Cambodia that a wife often negotiates prices or rents with customers instead of a husband. In the family, however, wife is obedient to husband. Husband attends usually community or village meetings. In other words, husband has more says socially than wife. It is found, however, through hearings from wives that they have no complaints on it because social matters are in the hands of husband. It is an important aspect in development that a woman has much less opportunities to speak their needs or ideas in the public. Moreover, girls are educated morally to be shy in front of people, though the attitude changes after one is married.

Marriage is very important for a woman not only personally but also socially and economically. A woman without spouse whether she is widowed, divorced, abandoned or not married, is disadvantaged in all aspects in the rural society. In Cambodia one fifth to one third of families are headed by women. As mentioned above, a woman is very busy generally. If a woman is not with her spouse, she is busier than a wife. She has to do everything in order to keep her household from cooking to farming practices, though some of the burdens are eased by her children. A female headed household often does not keep

cattle to plow the fields nor a person to handle the cattle. Unless she rents plowing or seeks for a help of her relatives, she can not grow rice. Moreover, a female headed household was given smaller piece of land when the land was privatized in 1989 because the female headed family was usually smaller in size than a male headed household (HALCROW, 1994). Home consuming rice is not produced enough and the female head should seek for other ways of earning family livings from transplanting rice in other's farm to vending farm products in a market. Thus many female headed households are left in destitution.

There is no distinct sexual division in farming practices in Cambodia (Ledgerwood, 1992). Both of sexes do nearly everything needed in the farm except climbing a palm tree done by male. But there are tendencies of the division in several works. Plowing, threshing and caring cattle are done more by male, and pulling seedlings and transplanting are done dominantly by female.

Women are less educated than men in Cambodia. Literacy rate of adult women over 15 years old is merely 43.1% where men's literacy is 89.6% in Kong Pisey District, Kampong Speu Province, and Women's average schooling is 1.9 years and men's 4.2 years (Rural Development & Resttlement Project, 1994). The socio-economic survey in this study shows that 76.3% of women over 16 years old and 91.3% of men can read and write. More women remain illiterate than men in both studies. It gives further disadvantage to women economically and it becomes also one of constraints in women in development.

(2) Women's Association

The Revolutionary Women's Association of Kampuchea was formed during the Hen Samrin regime. The association contributed to the literacy campaign lead by the government on one side but functioned in mobilizing adult males for the war fronts on the other side. The association turned its name to the Women's Association of Cambodia in 1989. The association was well organized at all the levels of administration from the province to the village level with several staff paid by the government. It played important roles in immunization campaign and helped the poorest women, especially widows, mothers or wives of men in the army, mothers with many young children, and orphans by giving them money, clothing, food or medicine through charitable contributions. Though the association suffered from lack of budget, it tried several works as sewing workshops, silk weaving, silk worm raising, cow banks, pig banks, fish ponds, rice mills, and child care centers with assistance of international organizations and NGOs (REDD BARNA, 1990).

The association was dismissed in 1991 because it was taken as a part of a political party, and the staff were shifted into the other offices of government. When the new

government started after the election, Secretariat of Women's Affairs was established and promoted to Ministry of Women's affaires later. The sifted staff of women's association came back to the ministry. The ministry attaches importance on strengthening women in the rural areas through trainings to understand on women in occupation, women in family, women in communication, and gender issues. The ministry set up offices of Women's Affairs at the provincial level already, and offices at the district level and at the lower administrative levels are still on the way of establishment, though the progress is slow of the budget constraint.

Department of Women's Affairs in Kandal province for example has 15 staff at the office in the compound of the provincial governor's office and its budget comes from the province. The office allocated newly an officer each to four districts such as Ponhea Leu, Kandal Stung, Leuk Dek and Lvea Em. The department has been working on credit for women, literacy education, child care, women's health, and social work & research with assistance in the budget from UNICEF and WFP, though the scale of the works is fairly limited. The credit for example reaches merely 22 villages in 6 communes in 5 districts. It plans training courses of income generation as sewing, handicraft, hair dressing and compost making at the newly constructed women development center in Ang Snourl donated by Japan. A staff picked up issues for women in rural areas on three points such as non-professionalism, no capital, and low education.

Department of Women's Affairs in Kampong Cham Provice conducts nearly the same activities as Kandal, such as credit, literacy education, child care, birth spacing, family food production and village road repair. The offices suffer from lack of the recurrent budget to carry out activities for women.

Though women's association changed its name and organization, it has been only the organization to work for women. Therefore, all the assistances for women in cambodia from the outside concentrate on Ministry of Women's Affairs at present. Foreign donors assisting in this sector are UNICEF, CCDP, CIDSE, DBFC, Forum Syd, IWDA, OXFAM Qubec-OCSD, UNPF, VSO, and WVI-CA. UNICEF is the largest donor in scale among them.

UNICEF has been assisting in the activities widely for women on credit, literacy education & child care, family food production, cow bank and special projects for the poor through Ministry of Women's Affairs in 18 provinces, 72 districts, 123 communes and 342 villages in the whole country. Its assistance started in 1986 on emergency help and gradually sifted to revolving fund and family food production. UNICEF disbursed US\$ 396,000 between 1988 and 1995 and its beneficiaries have reached 15,230 women. Requests of assistance come to UNICEF through Ministry of Women's Affairs and the budget is allocated after the assesment of the proposals.

H.2 Operation and Maintenance of Facilities (O&M)

H.2.1 Management of Irrigation System

When an irrigation system is put into practice, the biggest issue is who operates the facilities and who maintains them. If the issue is not taken up seriously, the facilities do not work as designed, and they are abandoned quickly as it happened often in the past. The beneficiaries of an irrigation system should operate and maintain the facilities by themselves in principle, and they are farmers.

As a government policy, however, the responsibility on management, operation, and maintenance of the facilities is divided into three categories according to the scale of irrigation systems, small, medium, and large as described below. The overall management lies under the responsibility of the Water Management Office of GDIMH, and the office is supported by its offices at the provincial and district levels.

(a) Small scale

- * The system is managed by District Office of Irrigation, Meteorology and Hydrology (DOIMH).
- * Where the system is located at interdistrict, it is managed by Provincial Bureau of Irrigation, Meteorology and Hydrology (PBIMH) or Municipal Bureau of Irrigation, Meteorology and Hydrology (MBIMH).
- * The system is operated and maintained by the beneficiaries, supervised technically by PBIMH/MBIMH.

(b) Medium scale

- * The system is managed by PBIMH/MBIMH.
- * Where the system is located at interprovince, it is managed by GDIMH.
- * The system is maintained by PBIMH/MBIMH in cooperation with the beneficiaries.
- * The system is repaired by GDIMH under the finance of government.

(c) Large scale

- * The system is managed by GDIMH.
- * The system is repaired by MAFP in consultation with the concerned ministries.

H.2.2 Necessity of farmers' organization

In order to operate and maintain the facilities effectively, farmers should be grouped into an organization such as waterusers' association. Where there is no organization, the facilities have not been used effectively, and there are many disputes on water use.

Thus, it may be said that farmer's organization is an essential condition to the irrigation system.

As one of irrigation systems, there are nearly 400 colmatage systems in the study area, most of which have been poorly maintained because of financial constraints. The gates are operated usually by the commune chief, and the beneficiaries in the commune work actually for opening and closing the gates. In case a gate is out of order, the soil is embanked in the canal to close the gate and it is cut to open the gate. An opening and closing the gate which are conducted once each in a year becomes a sort of event where many people around get together at the gate, because it is an important occasion for the local population in their usual life.

The commune chief is, however, an administrative chief, and he is not responsible for the operation by its nature of his position. The colmatage system including the canal and the gate should also be operated and maintained by the beneficiaries themselves. The commune has been working for the operation as the substitute of the organization, but it is not an organization practically. In order to decide matters on operation and maintenance, the beneficiaries should be grouped into an organization such as water users' association.

Where there is not an organization, it is difficult to operate and maintain the colmatage system effectively as many colmatage systems expose at present. And many conflicts occur on water between farmers and fishermen on timing of the gate operation and disputes on water use among farmers. Thus, farmers' organization is important and an essential condition to the colmatage system as well for smooth operation and maintenance.

Before an irrigation system is constructed, the responsible authority needs to gather the consensus of farmers who may be benefited or affected from it, though a request of construction comes from the farmers. There were cases that the facilities were destroyed by some farmers after the construction was completed. For example, it happened that a farmer cum fisherman broke the new water gate at the Tmor Da and Teuk Cha reservoir in Kampong Cham Province just after the completion. While gathering the consensus of farmers, they may be trained to understand a necessity of organization and possibly organized into water users' association.

It is also very important to establish a farmers' organization before the construction gets ready in order to involve farmers in the project. The first point is to take real needs and ideas from farmers into planning, and the second to include them in construction as laborers or any kind with payment. The involvement makes farmers feel

ownership of the system. An example was shown at the canal 90 in Takeo Province that farmers were enjoyed in manual excavation because the income from digging helped their economy and they had a hope to get the share of the benefit as a form of land. Even during construction going on, farmers may produce ideas, because when things are put into reality, they understand the system more clearly. If they think that the system is theirs, surely they become keen to maintain it later. As it was seen at Kan Tot farmers' association of water users in Takeo Province that farmers did not pay the water charge for four years between 1990 and 1994, because they thought the irrigation system was owned by the government, but after they understood the system was theirs, they started to pay the water charge.

II.2.3 Existing Farmers' Organizations

An existing water users' association was studied at Tnot Te village, Trea commune, Samrong district, Takeo province. There is a Tnot Te reservoir whose dike was initially constructed under the Pol Pot regime and rehabilitated by ADB (Asian Development Bank) fund in 1994. After the rehabilitation was completed, the association was organized by district authority in December, 1995. The authority appointed 32 committee members of the association, a chief and deputy, 3 gate managers, 5 to 6 members each in charge of 5 canals. They have an office of the association. The committee does not collect any water charge from the benefit farmers nor the committee members are paid any money for their work. Even those who participate in repair of canals and the dike are not paid. Any problems have not occurred since the association was formed, though it is half a year old. Hydrology officers come to check the reservoir once a week in wet season and once two weeks in dry season.

Kbal Po farmers' association of water users covers 6 villages in Treang District, Takeo Province, Kbal Po, Ou Po, Phum Po, Trapeang Proloss, Roveang, Tnot Chom, and there are sub organizations in the six villages. The water intake is at the canal of Treang lake which is widely flooded in wet season. The main canal is cemented at three dimensions. They have 4 old pumps (19 years) in which two are working and the other two are out of order. The facilities irrigate 200 ha and 70 member families belong to the association which was organized under a guidance of Kbal Po Rural Development Center through trainings. Members should pay 230 kg of rice per hectare for direct irrigation after harvest and 160 kg/ha for indirect irrigation.

Kan Tot farmers' association of water users is near the above mentioned association, but water source is different from it. Water is taken from the lake Thom whose dike was just rehabilitated by ADB fund in 1996. Two pumps were fixed by ACR (Ausrarian Catholic Relief) in 1983. It irrigates 300 ha in 13 villages, benefiting approximately

1,000 farmers and water is distributed for three months during early April and late June. Members should pay 230 kg of rice per ha for direct irrigation and 160 kg/ha for indirect irrigation after a harvest as water charge. Farmers did not pay the water charge during 1990 and 1994 because they deemed that the facilities were of the government, but they pay it now because they understand that the facilities are theirs. The chairman is paid 60,000 riels per month while irrigating, i.e., 3 months and he is provided a motor bike by ACR to inspect irrigation. The main canal is maintained by hired labors with the fund from the water charge, and the branch lines are maintained by beneficiaries themselves. Farmers around there are endowed rich in nature that they have a crop with irrigation during April and August, another crop with rains from August to December, and one more crop as a recession rice in the flooded basin of the Treang lake during December and April.

Chaan Water Users' Association is located in Prey Kandieng Commune, Peam Ro District, Prey Veng Province. The association was established through a guidance of the provincial department of hydrology and MCC (Mennonite Central Committee). The water source is the Kampong Sne Reservoir, irrigating 292 ha in the dry season paddy fields and 466 ha in the wet season rice fields. The dike, spillway, main canal and watergates were rehabilitated by ADB fund in 1996, but MCC rehabilitated the irrigation system in a small scale before ADB. The association has 350 member families in 3 villages, Chaan, Prey Angkueng, and Prey Kampeang. They do not pay any water charge but they set water laws to keep rules to use water from the system. There is a big pest problem of rats in the area which constrains rice growing in a certain season.

II.2.4 Establishment of Farmers' Organization

Most of farmers are poor, and they struggle individually to survive in the hardship. They cannot afford to think other things than their own living day by day. Moreover, they have bitter experiences on a group work in the past. Therefore, unless an organization brings a definite benefit to farmers, they seem reluctant to belong to it. A committee member of a VDC mentioned that she was debating in her mind if a community work gave the poorest another burden, though it was good for the village.

There are farmers' organizations found in the study area, but they are groups with a single objective, such as water users' association, rice bank, credit, cow bank, etc, and an integrated organization as an agricultural cooperative or the sort does not exist in the study area. It suggests that a definite organization with a single objective is more realistic at present.

As studied water users' associations, organizing an association was always led by

department of hydrology, rural development center or NGOs. At present, it seems difficult to organize an association by farmers themselves. The royal government issued CIRCULAR OF IRRIGATION GUIDELINES on 30th July, 1996. It says on Organizational Farmer Water Use Association as a government policy that the GDIMH/MAPF has a role to organize and supervise Farmer Water User Association in order to manage and operate irrigation system very effectively by farmers themselves. It also stated that the fuel for main canal falls under the responsibility of the GDIMH/MAPF. Therefore it is thought the best way that GDIMH and its provincial departments organize farmers into a water users' association.

And the officials at the provincial hydrology department are in charge of the task in reality. But as they are engineers, organizing farmers is hopefully cooperated with extension workers of agricultural department and NGOs who are well experienced in the field. They should meet farmers many times to discuss the necessity of organization. It is also expected to hold workshops on organization for farmers and open training courses on organization until farmers understand organization itself very well.

Institutional building of GDIMH is an important factor to fill the task of organizing farmers and follow up of irrigation system. An idea on the Technical Service Center for Irrigation System (TSCI) is meant to strengthen GDIMH's capacity to establish water user association and to manage the irrigation system, with more equipments under an advisory of Japanese experts. When an irrigation system is completed, it should be thought that it is not the end but the beginning of a project. The organization should be managed well and the system should work in a proper manner as designed.

In any organizations, it is the key issue to find a leader who is fully trusted personally and especially on money by the members, and the person should be elected by the members through a democratic procedure. If the trust on the leader is not built, the organization may collapse on the way. In order to keep an organization, some rules or regulations are also necessary, though members feel tight in the organization. A draft of water laws in Takeo Province is attached in Annex H.2.

An organization needs to collect necessary expenditures within payable amount by the poor in order to keep it sustainable, based on an idea that it provides farmers with benefit. Because the government office or aid agency can not keep paying the expenditures in a long run. Farmers are less educated than city workers, and they need to be trained on organization until they fully understand the objectives of the organization.

Female headed households are often more disadvantaged in many aspects of rural

community. When an organization is established, female headed families should be given equal positions at least to male headed households, or even more favourable considerations should be taken into account because they have been left in the disadvantage for a long time, for example, more chances to speak in the meetings, better conditions of the necessary payment and/or less labor contribution than male headed households.

As a summary of the above statement, the following points are required in order to succeed in farmer's organization, and the project as well.

- ① The committee members of an organization should be elected by the members through a democratic procedure.
- ② Chairperson should be the person trusted personally and especially on money by the members.
- ③ The organization should create rules and regulations of its own, such as water laws.
- ④ The organization should collect the necessary expenditures of its own within payable amount that cover operation, maintenance, and other necessities.
- ⑤ The organization should have a hall to meet, and rooms of clerk work, spare parts and keeping records. The hall may be used also as a community hall.
- ⑥ Committee members should be paid with reasonable amount.
- ⑦ Special considerations should be taken to female headed households.

The hall in No. ⑤ plays a role to gather people, thus, it is important as a center of the members to discuss matters on irrigation, organization, or anything related to water use, and to receive various trainings. General meeting shall be held periodically in the hall for smooth management of the organization.

The following figure shows a model organization chart of a water users' association, though the size and scale may differ upon the scale of the irrigation system. Sub-committees shall be organized when the system covers over many villages.

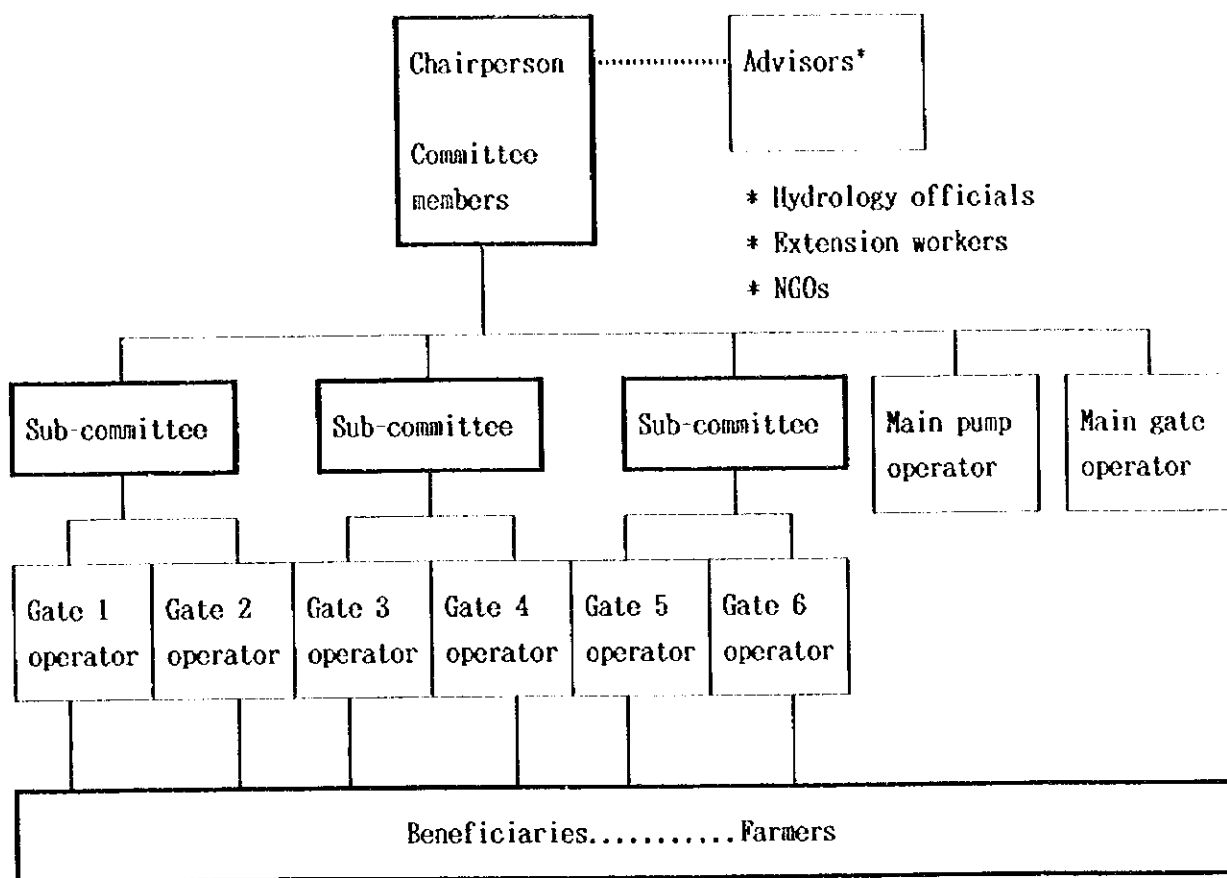


Fig. H.2 A Model Organization Chart of Water Users' Association

It is difficult to organize farmers into water users' association at all the existing irrigation systems at once, so it is very practical to begin with a model organization in a district, as a show case to farmers not organized yet, gradually the idea of organization will be disseminated to other irrigation systems.

An irrigation system improves water management on crops, but farming needs other technical improvements together to increase agricultural production. Agricultural supporting services as extension, credit, etc. can be provided little by little through the organization established for irrigation. And it is more practical to start with a single purposed organization and to extend its activities later for agricultural improvement than establishing an itegrated organization like agricultural cooperative at once.

H.2.5 A Case Study of Participatory Development

Two similar projects are going on in the lower plain in Takeo province near Vietnamese border. Both of them are excavating new irrigation canals, but Canal 92 by excavating machines and Canal 90 by human labors. They give us a good case study of local participation.

The canal 92 was designed by the provincial Hydrology office and approved by the provincial authority. The project is sponsored by a farmers' association of ten rich farmers. The size of the canal is 4m wide at the bottom, 9.5m wide at the top, 2.7m deep, and 11.6km long. It runs exactly east to west along the latitude. The canal will be used for irrigation, drainage, water transportation and fishing. It will benefit 4,200ha. The farmers' association expects to utilize 120ha for 12 years.

The provincial authority will collect water charge for agricultural purpose, transportation tax and fishery tax. The water charge will be collected through the farmers' association. The vast unused wet lands turn into good paddy fields thanks to the canal. The excavation set forth on 27th February, 1996 and the canal will be completed in June. It costed US\$ 95,000 totally. The side wall was just cut at a slope, the dike was merely embanked with dug-up clay, and no compaction was made on both the slope and the dike.

The Canal 90 is under excavation manually just 2km south and parallel to the canal 92. The cross size is the same as the canal 92, but only 6km long. The canal is expected to benefit 800ha. The construction is assisted by Prasad 2 of EU, paying US\$ 18,639. The work was rendered to farmer water users' association composed of 500 family members. The workers are paid 2,200 riels/m², and they can dig 5m² to 10m² a day, depending upon their power. They use a special shovel which is small and round, 10cm in the diameter, 50cm long, good for digging wet and soft clay soil. Most of the area were planted scarcely with floating rice, yielding very low and inconstant harvest once in 3 or 4 years. The canal turns floating rice to very sure dry season rice crop.

The team heard from the association members that they were happy to take part in digging and preferred manual work to a machine because the wage of digging helped their tiny income, they could endure hard work because they would gain the land title in the future, and they thought that the digging by association members would promote better operation and maintenance of the canal. It is planned to provide a family with 2ha of land each. The excavation will be completed in July, starting on 13th March, 1996. The canal was neither compacted at any parts. Prasad 2 project purchased 4 tractors of 80 horse power made in Russia to reclaim the lands into paddy fields.

H.2.6 Role and Activities of NGOs in Rural Area

International NGOs working in Cambodia are numerous, counting 95 organizations listed in CCC's (Cooperation Committee for Cambodia) directory in 1996. But there are a lot more organizations which did not report to CCC. NGOs started to work in Cambodia as early as 1979 after Pol Pot faction had been pushed away from Phnom Penh. And they have been covering quite wide sectors at present such as agriculture, child welfare and rights, community development, credit, education and training, emergency relief, environment, health, human rights, income generation, management and organizational development, rehabilitation, support to Cambodian organisations, transport and communication, water and sanitation, women in development, and others. They have been doing good jobs and filling the roles where the government can not serve for the nation because of lack of the budget. NGOs have created many jobs for Cambodians while training them on the jobs as staff of the organizations. In addition, there are 83 Khmer NGOs working at present, though most of them depend their budgets on international donors. Subsequently the scale of their works is so limited.

Table H.6 lists NGOs working in the five provinces. There are 7 organizations working in Kratie province, 11 in Kampong cham province, 11 in Prey Veng province, 24 in Kandal province, and 17 in Takeo province excluding UN agencies and official organizations of foreign countries. Among them, those working in the sectors of agriculture and community development in the study area were picked up and listed in Table H.7, showing the budgets of their work as well. Compared with official development assistance as Prasad, Rural Development & Resettlement Project, AUSAID Agricultural Extension Project, and ADB listed at the latter part of Table H.7. It is note worthy here that ADB has been funding actively in the field of irrigation, specifically on rehabilitation of irrigation facilities. Local NGOs working in the study area are listed in Table H.8 as well. They are 17 organizations in number.

Since there are many NGOs, methods of assistance are quite different from an organization to another. Their works are often fragmented one by one. And because of the nature of organization, their budgets are limited and their work is often on a spot in the limited area. But it does not mean that the quality of their work is low.

The NGOs have long experiences in development in Cambodia and get acquainted with people and the custom in Cambodia. If their experiences are utilized in ODA (Official Development Assistance) programmes as some of ODA agencies are doing, a development programme may be implemented more effectively. Some of NGOs are well experienced in organizing farmers, participatory development, agricultural extension services and training.

H.2.7 Conflicts between Farmers and Fishermen

The preliminary study reported that there were serious conflicts on water between farmers and fishermen. In order to make the points of conflicts clear, the study team heard from Fishery Department in three provinces and people from two spots where disputes were going on. While hearing, it was found that most of fishing lots were owned by only one fisherman who paid fishing tax of the lot alone to the Fishery Department.

In Kampong Cham, there are 13 fishing lots, most of which have conflicts to greater or less extent. The greatest point of conflicts is that farmers cut flood bush to clear the land for farming purpose adjacent to the water reservoirs and it harms on fry to grow in the bush, at the same time it narrows the fishing lots. The term, 'flood bush' is used here in stead of the often used term, 'flood forest' because the forest has turned to bush already by severe tree cuttings. In other words, farmers and fishermen are conflicting on the border of farming and fishing lots though the border was set and marked already by the Fishery Department. An exception is found in the 11th fishing lot of the Pol Pot canal. When farmers cut the canal to get water for rice crop, fishermen reject it to keep fishing.

A practical example of the above conflict is found at the Boeng Treang Reservoir, Donmao Kraum village, Tonle Boet commune, Tbong Khnum district, Kampong Cham province, that farmers have been appealing the district authority to cut the flood forest surrounding the reservoir to widen farmlands but the Fishery Department rejects to protect the fishing lot.

In Prey Veng, there are conflicts in five fishing lots (No. 8, 10, 11, 12, 14), and light disputes in nine fishing lots (No. 2, 3, 4, 13, 15, 16, 17, 18, 19) among 20 fishing lots. Main conflicts here are on four points as follows;

- ① management of the colmatage water,
- ② flood control,
- ③ clearing flood bush, and
- ④ farmers' fishing without the permit.

The Fishery Department explains that as the government encourages the increase of farm lands, an agreement of both sides favours for farmers finally. The fishing season is opened between October 1 and May 31, and in the rest four months, no body is allowed to catch fish.

A real case was studied at the Boeung Bac Ov reservoir (No.12), Svay Plosh commune, Peam Chor district, Prey Veng province on 6th June. When visited, two laborers hired by farmers were cutting the dike to get water into the reservoir because the water level of the Tonle Toch was increasing. The timing of cutting and filling the dike is always the problems between farmers and fishing lot owner. Therefore, when it is sensitive for

farming, farmers hire laborers to watch the dike not to be cut or filled by the fishing lot owner. When the owner wants all the fish in the reservoir to get out of it, farmers want still water for rice crop. Whenever the good timing is lost, the owner tries to negotiate the fishing tax to reduce, while he pays usually 140,000,000 riels a year.

In Kandal, there exist 72 fishing lots, categorized into three types, 19 reservoir fishing lots, 52 river fishing lots and a sand fishing lot. All of the reservoir fishing lots have conflicts between farmers and fishermen, though they are not serious. The points of conflicts are that farmers clear the land near the reservoir and plant rice, farmers open and close the gate of the reservoir untimely for fishing, farmers catch fish in the reservoir without permit, and farmers use car batteries for fishing without knowing its dangerousness. The Fishery Department in the province set the level of water and make agreement between farmers and fishing lot owner. The fishing tax is negotiated also here by the owner to compromise with farmers.

Farmers and fishermen have been disputing on water management, encroachment of farmers into the fishing lots in dry season and illegal fishing. Freshwater fishes are very important resources to provide people with protein. Moreover, inland fisheries give good income for fishermen with the licence, employees under the fishing lot owners and the government as a tax income. Fish production will reduce if fishermen continue intensive fishing with improved fishing gears. The fewer are fishes in the fishing lots, the more serious do the conflicts become in the future.

It is a fact that many farmers (40%, Socio-economic survey) go fishing when they are not busy in the farm mainly for home consumption and sometimes for selling when they catch more than enough. It denotes importance to reserve the fishing lots for farmers as well, as a form of public fishing lots where anyone can fish for free.

The swamps inside the colmatage are endowed with the rich nature for farming in dry season when water recedes, the fertile soil and enough water. Average yields of rice are higher in the areas than in the non-flooded areas. Thus they are important areas to develop agriculture.

However, it is difficult to manage water in the colmatage system good for both farmers and fishermen. Because the issue lies on timing of water when farmers want water, fishermen do not want it and vice versa. In reality, nothing can be done much on it with the fishing laws existing. Therefore, in the short term plan, it is recommended to remain the fishing lots as they are, and to develop agriculture at the lands where a fishing lot does not exist. In the long term, it is recommended to demarcate clearly the area for fishing and farming with an embankment to develop farming, and water for farming shall be regulated, but water for fishing remains natural.

H.3 Rural Development

The majority of people, 85% of the whole population, live in rural areas in Cambodia. Rural population is much poorer than urban dwellers, their income is 1/4 of urban population, spending is less than 1/3. Even rice production is not enough for home consumption in many households. Social infrastructures are poor as well. There are needs of improvement of rural life in all aspects from agriculture to increase income to social infrastructures to better their livings in order to fill the gap between urban and rural areas.

The main components for rural development are as follows:

- * To pick up the real needs of rural population and local participation
- * Necessity of farmers' organization
- * More involvement of women in development and living improvement extension workers
- * Cooperation with NGOs
- * Improvement of social infrastructures

H.3.1 Farmers' Voices to Development Projects

It is essential that a rural development meets real needs of people in the target area. The socio-economic survey reveals that they want projects for development in the following order in multiple answers. It is obvious that farmers think they need irrigation and drainage first.

① Irrigation facilities	87.0%
② Drainage facilities	63.1%
③ Village to village roads	51.4%
④ School	45.9%
⑤ Domestic water system	25.4%
⑥ Medical facilities	23.9%
⑦ Sanitary facilities	22.9%
⑧ Post-harvest facilities	17.8%
⑨ Electricity	17.7%
⑩ Farm roads	10.4%
⑪ Others	bridge, pump, tractor, sprayer, transportation, well, ox

H.3.2 Planner of Village Development

More than half of farmers (56.4%, Socio-economic survey) answered that a village chief was responsible for planning of village development, 9.1% of farmers answered foreign donors, 5.4% village development committee, 4.3% officials of agricultural department,

and 2.1% officials of rural development. Fishermen replied in the same manner as 57% of fishermen think that a village chief is the person to plan a village development. It is probable that the answers depend on whom villagers met in development work in the past. If there is no one from outside, a village chief is the person to plan the village development. After village development committee is organized in the village, it will take the place.

H.3.3 Public Institutions for Rural Development

Most of ministries have their departments at the provincial level and working for rural development. Among them, Ministry of Rural Development is totally responsible for rural development. Ministry of Rural Development was established when the present royal government was instituted in 1993 after the election. The ministry has 8 departments at the central office such as Administration & Personnel, Procurement & Finance, Planning & Public Relations, Training & Research, Rural Water Supply, Rural Health Care, Community Development, and Rural Economics Development. It has also local institutions as Department of Rural Development at the provincial level, Section of Rural Development at the district level, and in-charge of Rural Development at the commune level.

The ministry aims for elaborating rural development policy, coordinating, cooperating, implementing, and monitoring and evaluating country wide rural projects in order to encourage rural population for economic self-reliance. The core of a development is local population themselves in planning and implementation.

Other than the offices under Ministry of Rural Development, the Provincial Rural Development Committee (PRDC) has been formed to decide development projects at provincial level and the committee is chaired by the provincial governor and consisted of the directors of the concerned departments. The director of rural development department plays a core role as a secretary of the committee. District Rural Development Committee (DRDC) is also on the way of organization. At the village level, the Village Development Committee (VDC) is in progress to be organized under a guidance of District Section of Rural Development and aid agencies, though organization rate in villages is still low. Theoretically, the flow of a development plan is requested by the VDC, goes through DRDC, is discussed in PRDC, and finally submitted to the central government as a bottom-up flow. In reality, a plan flows often in a top-down system, because the institutions are not fully functional yet of budget deficit. Therefore, an important way of planning at present is how a developer picks up voices and ideas of local population.

If it is an agricultural development, Department of Agronomy or Technique, Economy & Extension (DTEE) is concerned at the central office, and its offices at the provincial and the district levels work actually for the task. If it is an irrigation project,

GDIMH and its offices at the provincial and district levels function officially for the project. And an integrated rural development is under Ministry of Rural Development.

These offices and committees are potential to lead development programmes in the rural areas. The VDC (Village Development Committee) under a process of organization is highly potential to a rural development programme because the committee members are elected by villagers through a democratic procedure and it is the place where local population discusses their own needs of development and implements development programmes. It is a local participation in development in its nature.

The constraints in development on these offices are deficit in the budget, low salaries to the officials, and lack of equipments and office supplies, which make the staff difficult to proceed the programmes unless they are provided with fund by aid agencies. Another constraint is that many offices at the district level are in the process of institutionalization, and it takes time to complete it of the budget deficit again. Many staff in the offices if not all need more trainings on their specialties to upgrade the quality of work. And a coordination of development programmes is very important and its responsibility lies under Ministry of Rural Development and its offices at the provincial and the district levels through the development committees.

(1) Village Development Committee (VDC)

VDC was initiated by CARERE project (Cambodian Resettlement and Reintegration Programme under UNDP). At present, Ministry of Rural Development is promoting the idea to organize VDC in villages throughout the country. So far, the village chief (Mephum) has been a key person for village development, though he is not responsible for it. He still represents the village in all aspects.

VDC is composed of several committee members who are elected by the villagers through a democratic procedure guided by a district rural development officer. The size of committee depends on a size of a village or number of projects in the village. All the committee members are usually not paid but work on a voluntary base. Most of VDCs in the study area are new, and it is expected that they will function as it was designed initially, whether it is a planner or a receiver of development plans.

A real VDC was studied at Prek Hau Village (East), Prek Hau Commune, Takhmau District, Kandal Province. The VDC is composed of five committee members, chairperson, deputy, secretary and two accountants. The two accountants are women. The election took place on 1st April, 1996. When studied, the committee is just 2 months old. There were only five candidates for the election and all of them were elected to the above positions. Mephum is not included in the committee. Eighty villagers, all of them farmers, took part in

the election out of 336 families and 1,803 persons in the village. The term of committee members is five years.

The village meets every year with flood, destroying the canal, village roads and rice crop. Therefore, the committee tackled first to rehabilitate a village road and canal. Five hundred villagers took part in embanking soil on the village road. They worked for the part of the road near their houses. The work was completed merely 10% of the whole work required so far. And its result shows a patch work on the road where the parts people worked are hiked 80cm and unworked parts are left low as they have been. Some villagers donated money for the rehabilitation of road, ranging from 500 riels to 50,000 riels. The committee mobilized students, government officials and villagers to rehabilitate the canal. But they could not complete the work and an excavator of the district finished the rest.

The committee is planning to dig wells, to make latrines, and to have a health project in the future. The committee members feel happy to contribute to developing the village though they are not paid for their work, and feel confident now to solve village problems which have been neglected long time. But they feel sometimes debating in their mind whether the committee activities are right or not because most of villagers are too poor to have extra works. In the course of a look at the road worked, a middle aged widow talked to the committee members that she felt she should join in the programme but she could not afford to do it. The road in front of her house is left unworked.

In Kampong Cham Province, 60 VDCs were organized already in 5 districts as Batheay, Cheung Prey, Prey Chhor, Kampong Seim and Kang Meas. An organization rate of VDC in the province is merely 3.3% yet out of 1,811 villages. The Department of Rural Development plans to organize more VDCs.

In Prey Veng province, 250 villages have organized VDCs led by Prasad 3 project of European Union (EU). The villages belong to 5 districts as Prea Sdech, Kampong Travek, Kampong Leav, Kamchay Mear and Sithor Kandal. An organization rate of VDCs reaches 22.0% out of 1,136 villages in the province.

Department of Rural Development, Kandal province, has organized 18 VDCs in 2 districts as Ponhea Leu and Takhmau in collaboration with WFP (World Food Programme), and is planning to form 21 VDCs in 3 districts of Leuk Dek, Lvea Em and Ang Snourl. An organization rate is still 1.9% of 1,083 villages in the province. It is explained that VDC is easily organized when there is a development project in the village, but rather difficult without any programmes.

In Takeo province, VDCs have been organized in 290 villages of 1,115 villages, reaching

26% of organization rate. They were organized in collaboration with foreign donors and local NGOs. The committee meets once a week and carries out general activities, functions as a sub-structure of Ministry of Rural Development, and receives advices from district office of rural development.

(2) Provincial Rural Development Committee (PRDC)

At provincial level, PRDC has been formed in Kampong Cham, Prey Veng, Kandal and Takeo under Ministry of Rural Development in order to discuss development plans in the province. The PRDC is chaired by the governor and the members are directors of departments in the province. The committee meets once a month to three months. The PRDC in Takeo invites all the foreign donors and NGOs working in the province to the meeting as observers. Where Prasac projects of EU are going on, the province forms a coordinating committee of nearly the same members of PRDC. Rural Development Committees (DRDC) have also been in progress to be organized at the district level countrywide.

H.3.4 Farmers' Organization

Farmers' organization is very important for agricultural development, and it is a requirement for irrigation project as a form of water user association for operation and maintenance. The concerned offices, GDIHM and Department of Technique, Economy & Extension (DTEE) under MAFF, shall be intensified on organizing farmers as forms of Technical Center for irrigation System and Agricultural Extension Project. The existing irrigation systems need farmers' organizations as well, which are put into practice through a model organization scheme, one in a district as a show case.

H.3.5 Women in Development

Strengthening of institution is necessary at provincial, district, and particularly village levels in order to improve women's disadvantages in rural society and to let women involve positively in development, because they are highly potential. The main constraints are deficit of budget and quality of the staff for women development who should be trained to be more active in the fields. Women Development Centers provide women chances for training and speaking women's needs in the society. It is recommendable to create extension workers for improving all the aspects of living from cooking to hygiene in a family, and the extension workers will belong to Ministry of Women's Affairs.

H.3.6 Roles of NGOs

NGOs have been helping rural population where government services do not reach. They

have been serving people in quite wide fields. The NGOs have long experiences in development in Cambodia, and many local NGOs were organized to work for the people. Rural community development needs various specialities in development. Their experiences and knowledge are combined with ODA fund to implement projects more effectively.

H.3.7 Social Infrastructural Development

(1) Education

Education plays an significant role in development though it costs a lot nationally and individually. Yet, the present state is very poor both in quantity and quality.

(a) Construction and rehabilitation of school buildings

Many primary schools are lacking of class rooms from increasing one year by changing education system and increasing schooling-age children. And many school buildings have dilapidated badly without partition wall between classes and with bullet scars on the walls, class rooms are dark, and some of the buildings are even dangerous to pupils. They should be constructed or rehabilitated urgently to give children more incentives to come to school. Secondary and high schools need improvement of buildings as well, but primary schools need it first.

(b) Quality improvement

In order to improve quality of education, many things are required as supply of clean water to students, construction of toilets, re-training of teachers, intensification of teacher training colleges, curriculum development, more supplies of textbooks, development of teaching aids, etc.

(c) Informal education

There are many children who remain unschooling with some inevitable reasons, and they pass ages of proper schooling. They should be saved from illiteracy or under-education. Government-run informal classes are needed for them, at least one within commutable distance. For example, it is an idea to form informal classes at the existing schools when the class rooms are not used for formal education, and a special curriculum and textbooks shall be developed.

(d) Adult education

Adult education is required to eradicate illiteracy and offer simple calculations, though it is done in limited areas under UNESCO projects through Ministry of Women Affairs. Adult education surely will contribute to rural development later, because the illiterate have difficulty in understanding on their learning of new techniques.

(2) Public Health

(a) Hygiene in a village

In order to keep hygienic conditions in villages, it is essential to provide people with clean drinking water, sanitary facilities, and primary health care. On drinking water, deep wells with hand pumps will provide people with clean water in the short term project, but clean water shall be distributed to houses through pipes in the long term project. On sanitary facilities, a cheap toilet shall be disseminated to each house immediately because a toilet is scarcely found in rural area, and sewage drains should be dug in villages to get rid of rotten water from the villages. Primary health care includes health and hygiene education, protective medical cares, immunization, mother & child care, and a facility to separate the patients with infectious diseases as tuberculosis, cholera, etc. from healthy people.

(b) Hospitals and health centers

Many district hospitals and health centers at communes are not in good conditions physically. And there is a movement to combine the health centers into referral hospitals to make them more efficient and more effective. Thus, hospitals and health centers need reconstruction and rehabilitation. Those hospitals and health centers suffer from lack of medical equipments, medicines, and office supplies to provide local population with proper curative and protective medical cares. In order to improve medical cares, doctors and medical staff should be retrained, because many of them were trained in very short time just to meet the demands quickly after Pol Pot regime had collapsed.

(3) Electrification

There is no electricity source in rural area unless individuals provide themselves with it by small generators or car batteries. Electrification in rural areas will facilitate communication on development, public information, and education, thus, it is an important tool for development and is needed highly.

(4) Telecommunication

There are no telephones in the study area except Takhmau which is within the reach of Phnom Penh. It is very difficult to communicate with rural areas at present, though a radio communication is used partly. Telecommunication net work is needed to facilitate development in rural areas.

H.4 Rural Sociology in Boeng Phtea Area

The people in the study area think that water for farming is the life line. In a word, they live on water of the Boeng Phtea, surrounding depressions, and artificial reservoirs though most of the dikes keeping water in the reservoirs have dilapidated. Hence the reservoirs can not keep enough water as expected and they can not often harvest rice at the end because of water shortage. Though the people are with problems, security of the study area is well kept.

Houses in the study area are built on the left bank of the Mekong naturally made, at the 300 m wide belt in the same pattern up and downstream, on the higher places along the Phras Konlong road and along the road going to Boeng Kagnchap Tbong. But Anlong is the last village along the Phras Konlong road until you reach Vihearsour commune where you can find many houses in a congregate. Livings are earned by farming and fishing in the depressions centered at the Boeng Phtea surrounded by the Mekong bank and the Phras Konlong road. Farming and fishing are done by commuting from their houses at a distance.

Public institutions are prepared for rural development in terms of personnel, yet they suffer from financial difficulties to carry out development projects. No farmers' organizations exist in the study area. VDCs (Village Development Committees) were formed at all the villages in Prek Tamark commune through a top down procedure. Sometimes a monk plays the core role in a village development if he is active in development. Several NGOs (Non-governmental organizations) are assisting the people in road construction, health, education and fish raising, but none of them in agricultural development.

Literacy rate in the study area is as low as 72.5% totally over 15 years old, men 86.7% and women 58.7%, and it constrains village development. Net schooling rate of children between 6 and 11 years old is 63.1% at primary school and many children drop out from school in the course of their study. Women in the study area lead a busy life and contribute a lot to farming and society, yet their social status is still low. Social infrastructures are yet to be improved much.

H.4.1 Rural Socio-economic Survey in Boeng Phtea Area

A socio-economic survey was done by interviewing 500 households totally to grasp the present state of the study area. The figure, 500, is over 10% of the total households, 4,992 in the study area. Number of the interviewees in each commune was decided according to the area of the communes included in the study area as follows:

Prek Tamerk	100
Puk Reusei	182
Sanlung	25
Vihearsour	175
<u>Prek Ampil</u>	<u>18</u>
Total	500

By chance, 22 fishermen were included in the survey, and farmers were 478. A fisherman is defined that fishing income overcomes farming income. Questions were set on rural society, agricultural economy, and agriculture, comprised of 64 questions.

Fourteen interviewers were found in the same communes as the interviewees in principle, but some of them gave it up on the way of the orientation because the questions were beyond their understanding. The study team explained the interviewers on each question three times in order to let them understand questions fully before they interviewed. The interviewees were always set at one after five households to avoid any intentions of choosing households. A key person supervised the work throughout. The reply sheets were checked by the team twice, one time after 10 interviewees to find any initial errors of interviewers, and another when the interviews were over.

As a basic information, there are 4,992 families in the study area. The survey discovered that 78.6% (393/500) of families were nuclear families where a couple did not live together with their parents. Children of 15 years old and under occupy approximately 40% of the whole population, the teen-agers are the most populated among all the tens, and number of children under 10 is decreasing. The thirties are less than the forties and the twenties, revealing that they were affected most by wars in the past (Figure H.3).

Through the survey, it is found that a major problem for local population is flooding, taken serious, followed by poverty and poor transport, taken as problems. Diseases and drinking water follow them, taken as a little problem, then lacking of hospitals and schools follow them finally. Specially remarked issues are irrigation system, picked up by 132 farmers as serious problem, technical guidance on pig (9 farmers) and fish (1) raising, animal draft man (2), and pest (2). But they take security well maintained in the villages. There was a big flood at the areas along the Mekong last year, which did not occur so often, for example, once in ten years. Probably it reflected the responses to a question on the problems in the villages.

The survey also makes clear that farmers want irrigation facilities first in emergency, followed by flood protection, farm roads, credit service, post harvest facilities, drinking water supply, electricity and hospital, and school at the end.

II.4.2 Public Institutions for Rural Development in Boeng Phtea area

Public institutions for agricultural and rural development in the study area are the relevant offices in the district governor's office, such as Agriculture, Rural Development, Public Works, Women's Affairs, Health and Education. But all the offices are in the financial difficulties to carry out development programs, therefore their work is so limited, and they expect any assistance from outside.

District Rural Development Committee was formed in Ksach Kandal, chaired by the governor and the members are directors of Rural Development, Agriculture, Finance, Health, Transport, Religion, Women, and Police. A meeting is held when a development plan is produced, but no regular meetings.

At commune level, all the five communes in the study area formed Commune Rural Development Committee. The committee is chaired by the commune chief and it involves two deputy chiefs and all village chiefs belonging to the commune as committee members. Some of the committees hold regular meeting, e.g., once a month, but the other committees never held any meetings because there were no development plans in the past.

VDCs were formed in Prek Tamerk commune. All the VDCs in the commune were established in March, 1995 under a guidance through the commune chief. Number of committee members differs from 10 to 12. All the committee members including the chairman were nominated by the commune chief against the principle that all the committee members should be elected among the villagers through a democratic procedure to represent ideas of the villagers. Furthermore no women are included in the VDCs. One point that they keep the principle is that a village chief is not included as a member of VDC, because the function of a village chief is to keep security in a village and to keep records on demographic statistics.

However, some of the VDCs have been working well for the people. For example, VDC in Svay Att Leu village introduced new rice varieties to the village, rehabilitated a small canal to a water reservoir, rehabilitated a village road, and has been rehabilitating another canal, and VDC in Anlung village rehabilitated the dikes of the Pro Pagn reservoir and the Ta Tum reservoir using WFP rice, constructed two gates at the Phras Konlong road, and proposed a plan for canal rehabilitation to the district office.

On the other hand, there is a VDC that even the chairman and his deputy do not know that they are the committee members. The active VDCs may function for promoting development plan in the villages though they were established through a top-down method.

II.4.3 Farmers' Organizations in Boeng Phtea Area

Any Farmers' organizations were not found in the study area. All the interviewees in the socio-economic survey replied as well that they did not belong to any organizations nor group. However, there are rice banks and managers of the reservoirs in the study area as farmers' organization if they are included as one though their organizations are very loose.

There exist two rice banks in the study area at present, one in Boeng Kagnchap Tbong village and another in Knong village. Both of them were established in December, 1995 under a guidance of Ministry of Rural Development in which rice was provided by WFP (World Food Program). Both of them have a small storehouse to stock rice in the village.

A hearsay on a rice bank in Boeng Kagnchap Tbong village reveals that three persons in management were selected as chairman, assistant and guard. The interest rate is 20%, and approximately one hundred farmers borrowed rice from the bank since December, 1995. It is good for the poor because it is easy to borrow rice. But the return rate is not so good that the initial 22 tons of rice stock reduced to 10 tons in June, 1997.

On all the reservoirs in the study area, the manager and sometimes his deputy are decided to maintain the reservoirs. When there is any breakage, the manager organizes people to work for rehabilitation of the dike and the water gates. It was found through hearings from the managers that the beneficiaries of a reservoir worked usually to rehabilitate the dike and water gates on their own. But there was a case that a manager paid all the expenses from his pocket in stead because he was given the fishing right solely in the reservoir. There were no reservoirs that the beneficiaries paid any water charge but labor services when required. The socio-economic survey showed as well that all the farmers did not pay water charge.

There is a reservoir called Bravosh where a manager is nominated. But he is not a manager in fact at present, he presumes that his name is put as a manager because his grand father was a manager in the Sihanouk regime. That is why the reservoir was not maintained at all in the past 30 years, so no water is kept at present.

A manager is usually selected through discussions among the land holders who take water from the reservoir. It is assessed that people select a manager through a democratic procedure in a sense. But the system of reservoir management seems very loose.

However, farmers' responses on farmers' organization in the future were positive to wish belonging to agricultural cooperative and water users' association, pointing the former 99% and the latter 99.6% in the socio-economic survey. Farmers expect supply of materials,

marketing of farm products, and credit from agricultural cooperative, but not much on post harvest facilities.

It is noteworthy that 489 farmers are willing to pay water charge in the future. But the rest eleven are not willing because seven of them have enough water in their fields, and four are too poor to pay. The payable amount of water charge is 13,000 riels on average in wet season, 35,000 riels in dry season and totally 48,000 riels on average per farmer per year, replied in the socio-economic survey.

H.4.4 NGOs Working in Boeng Phtea area

There are several NGOs working in the study area, but no NGOs working for agricultural development. Among them, Hun Sen project is the biggest presence, it reconstructed Phras Konlong road between Knong and Viheresour, it is rehabilitating two bridges on the road, constructing five new buildings of Knong primary school, and another building of Viheresour Cheung primary school.

SHARE (Services for the Health in Asian and African Regions) has been working for health totally in Ksach Kandal district since 1993, giving health workers training, rehabilitating commune health centers, constructing a new building for tuberculosis in the district hospital, disseminating toilets through credit.

SAO (Southeast Asian Outreach) has been assisting farmers in fish culture in Kandal province as a SCALE project, and it includes Ksach Kandal district as well. SAO helped to excavate 13 fish ponds for 19 farmers in the villages as Sanlung, Vihearsour Cheung, Vihearsour Tbong, and Prey Chas in the study area, utilizing 'Food for Work' project of WFP, and provides fingerings to the farmers. SAO puts more importance on poor farmers, thus small scale fish culture. SAO input US\$ 596,000 in 1996 and US\$ 351,000 in 1995 totally for SCALE project.

GRET (Group de Recherche et D'echanges Technologiques) has been providing rural credit and drinking water by digging wells in Ksach Kandal district.

JSRC (Japan Sotoshu Relief Committee) constructed a building at Puk Reusei Krom primary school and provided 500 picture books to a resource center in Ksach Kandal. Credit Association donated a school building and CIDA (Canada International Development Agency) has been constructing another school building at Vihearsour Cheung primary school, though both of them use ODA fund. CAPE (Cambodian Assistance to Primary Education) has been assisting in educational training in the same school.

II.4.5 Women in Rural Society in Boeng Phtea Area

The socio-economic survey reports that 51.0% of total population are women, that seems normal percentage of women in a usual society. According to the office of women's Affairs, there are 3,994 female headed families among 18,994 total families in Ksach Kandal district, reaching 21.1%, but merely 8.2% of households are female headed in the socio-economic survey, 41 families out of 500. A female headed household often meets more difficulty in living than male headed household.

Women in the rural area lead very busy life usually, and women in the study area are not exceptions. They work 12 hours and 6 minutes in a day on average. They work for farming in the fields for 5 hours, housekeeping for 3 hrs. 45 min., child care for 1 hr. 41 min., cooking for 1 hr. 8 min., and followed by animal care (57 min.), washing (55 min.), and water fetching (32 min.) Other than those, many women are devoted to home industry as grass mat weaving and removing hard coat of lotus seed in the study area.

Though wife works hard in the field and in the house, social matters are in the hands of husband, attending meetings and making a decision of social issues. Women have less opportunities to speak in the public, nevertheless they do not complain on it. Furthermore, women are less educated and more illiterate than men (Refer to the next paragraph), and it gives more disadvantage to women in the society.

Lotus and grass mat weaving bring good money to farmers in dry season in the study area. After collection of lotus seeds, drying them and cutting the seed coat are the work of women. You can hear a simple rhythm here and there of cutting the hard cover in the villages. Grass mat is woven mainly by women and rarely together with men, 2 women in a team, one throwing a piece of grass into threads and another tightening grass with a wooden bar. They produce a colorful mat.

In dry season when farming is not busy, many husbands go to Phnom Penh to earn cash needed for family finding a job in cyclo driving, moto-taxi (motorbike taxi) driving, labor in construction, etc. Because access to Phnom Penh is easy from the area. While husband is absent at home, wife takes care of family in all sense, more burdens on the shoulders of wife.

There is only a staff in the office of women's affairs in the district. She carries out women credit for 51 families in Knong village and 43 families in Antong village with the fund of UNICEF. The interest is 3%, lending a woman 100,000 riels to 150,000 riels for 10 months. The borrowers use the credit for buying a weaving machine of grass mat, planting vegetables, opening a small shop, etc.

The office cooperates in training of villagers with offices of health, education, and agriculture. The officer picks up issues of women such as schooling of children in female headed families, too many children, and no professionalism. She hopes to have a women development center in Ksach Kandal, training professional skills of sewing, dress making, hair dressing, etc.

II.4.6 Social Infrastructure in Boeng Phtea Area

The social infrastructures in the study area are very poor at present, though the minimum structures are prepared, communication net work is scarce, education is not enough, health services do not fill the needs, and no electricity.

(1) Communication

Since there are no telephone lines available, no mobile phones communicable, nor even a post office available in the study area, a direct contact or a communication through friends or acquaintance is the surest way of communication for the people. Government officers in the district offices and commune chiefs use a radio communication of hand talky among them and to the offices in Phnom Penh.

People in the study area receive outside information through radio broadcasting (463/500), orally through neighbors (377/500), and through TV (249/500). It means that radios are held at 92.6% of the households and TV sets were bought at nearly half of houses. Newspapers and magazines are not common at all, only 4 people read a newspaper and two read a magazine as a news source (the socio-economic survey).

It takes villagers in Prek Tamerk one hour to Phnom Penh and one and half hours to Takhmau, the provincial capital by car or motorbike via ferry and the highway 6A. It takes them 4 hours to Prey Veng. So people prefer Phnom Penh to Prey Veng when they need to buy things. Minibuses are available for villagers going to Phnom Penh or moving within the study area as a public means. And when they move in a short distance, moto-taxies are more convenient.

For villagers in Sanlung commune, an access to Phnom Penh and Prey Veng is nearly equal, yet they prefer Phnom Penh to Prey Veng, because they find everything they need in Phnom Penh. The way to approach Phnom Penh was much improved after the highway 6A and Chroy Chang Va bridge were reconstructed by the assistance of Japan.

(2) Hospitals

There are one district hospital, 5 commune health centers, and 2 private clinics in the study area. The district hospital has 17 rooms and 25 beds at present, and a new building is under construction for tuberculosis, increasing 4 rooms and 40 beds under a grass-root grant aid of Japan by SHARE. As Table II.9 shows, there are 3 doctors, 2 medical assistants, 13 nurses, 1 midwife, 2 laboratory workers, and other 11 staff in the hospital.

Each commune health center has two staff paid by government, one primary nurse and one midwife, and 1-2 trained staff and 2-3 health educators who are not paid. Private clinics are operated by doctors or health workers of government.

The health center has been rehabilitated already at Puk Reusei Commune, the health center at Vihearsour will be extended by government in 1997, and the health centers at Sanlung and Prek Ampil by SHARE in 1997. An NGO, SHARE has been assisting health sector at Ksach Kandal district in a good deal.

When a villager gets sick or delivers a baby, the first contact point is the commune health center. Furthermore, the health center provides villagers PIC, vaccination, hygiene education, etc. as well, and the roll in health is very important in the area. Some people complained that the distance to the health center was too far for small children, old people, and pregnant women to reach.

Medical treatment and medicines are free for villagers in the district hospital, but health centers which have been reformed try to change their policies to collect fees for medical treatment and medicines in order to revolve the funds. Medicines are provided by WHO and UNICEF according to the number of patients received at each hospital and health center.

(3) Schools

There exist two kindergartens, six primary schools, and two secondary schools in the study area (Table II.10). In those schools, there are 218 children in the kindergartens, 4,868 pupils in the primary schools, and 973 students in the secondary schools. In Ksach Kandal district, there is a high school, though it is located just out of the study area.

Almost all the primary schools lack of classrooms except one, Prei Chas primary school, so that schools are forced to carry out double shift of education in a day. And two primary schools borrow rooms from the secondary schools, Knong and Puk Reusei Leu primary schools. But Knong primary school goes on constructing 5 buildings under a help by Hun

Sen Project, and two buildings are under construction at viheasour Cheung primary school with help of Credit Association and CIDA.

Many school buildings have dilapidated, hence they need rehabilitation or reconstruction. As Table H.10 shows, out of the 31 existing school buildings, seven need reconstruction and 14 need rehabilitation, but it merely fills the number of existing school buildings, number of new school buildings shall be added to these figures to fill the shortage. In addition, students at the three levels of education are expected to increase in the future, and it shall require more classrooms and school buildings. Furthermore, some of classes are overcrowded as 48 pupils in a class in primary school (Table H.10).

According to the socio-economic survey, total children between 6 and 11 years old are 461 in the study area and 566 children are studying in primary school, showing that the gross schooling rate is 122.8% in primary school. It is because 275 children go to primary school over their schooling age (actually 48.6% of pupils are over the age), so the net schooling rate is 63.1% in primary school in the study area. It is found that even an 18-year-old youth is studying in primary school and several 17-year-old youths. The net schooling rate of secondary school is as low as 23.8%.

The primary schools in particular reduce classes distinctly according to progress of grades, 40 classes in 1st grade end surprisingly up with only 4 classes in 6th grade in the study area (Table H.10). According to a school master, dropout rate is 9% every year, and in the socio-economic survey, there are 996 dropouts from primary school totally throughout ages among 3,112 people and 541 persons have never studied at school. It is probable that many of them were affected by the wars. The figure of dropouts exceeds to primary school graduates, 807 persons. But in any case, too early dropout may cause a child illiterate.

Literacy rate over 15 years old is 72.5% totally in the study area, men 86.4% and women 58.7% (the socio-economic survey). Girls are 45% of children in kindergartens, 44% in primary schools, and 31% in secondary schools, revealing that the higher is education, the fewer girls do attend schools (Table H.10). In other words, fewer girls go to primary school than boys by 21%, the difference is fairly big.

(4) Electricity

There are no power lines in the study area. Electricity is provided for a few people by a group generator if they take part in the group. Another electric source is a car battery at 21.6% of families in the socio-economic survey. And most of people do not have any electric source, but they use an oil lamp (Chang Keung) or a candle for lighting.

(5) Cooking fuel

The socio-economic survey reveals that 100% of families use firewood as a cooking fuel, and only a family uses charcoal together with firewood. Fire wood is collected mainly at the water reservoirs where the natural bush is still remained. Some collect it at homestead, or others get wood chips and wood peels at a timber factory over the Mekong river.

In order to study on firewood at a household, the study team had hearings from villagers as shown in Table H.11, and found that villagers suffered from collecting firewood. They transport firewood by cart or bicycle at a distance of 1 km or even 10 km away from their houses. The quantity of firewood they use differs largely from 2.503 m³ to 0.064 m³ per family per month depending on family size, mat grass dyeing, pig raising, or kind of wood. Children collect mainly ujas (*Mimosa pigra*) which is of poor quality as firewood, but ujas grows vigorously at any places near houses wherever abandoned and it is light to carry.

A simple average of firewood consumption is 0.797 m³ per family per month, calculated from 20 samples (Table H.11). Though very rough, the total firewood consumption is estimated 47,743 m³ of wood per annum in the study area (0.797 m³ x 12 months x 4,992 families = 47,743 m³).

A mat grass dyeing uses the largest amount of firewood at a household, which is the most popular home industry in the study area. Cooking stoves at houses are very simple ones where a cooking pan is just put on three stones, so that fire is used very ineffectively. If villagers use an improved type of cooking stove, it will help save much firewood. Other than households, brick making uses a big amount of firewood in the study area.

(6) Temples

All of the people in the study area are buddhists, and no mosques and churches are found in the area. There are seven temples in the study area as Wat Sova Vattei in Prek Tamerk village, Wat Pe Chey Rang Sei in Agn Cheng Leu village, Wat Enda Ly Bo in Puk Reusei Leu, Wat Tro Pang Brey in Thmei village, Wat Prey Lak Mchas in Prei Chas village, Wat Vihearsour in Vihearsour Cheung village, and Wat Ta Tul Rattanaram in Tatu. On average, there is one temple in three villages. Wat Pe Chey Rang Sei holds a primary school in the compound.

A temple is the center of mental life. People enjoy themselves in the occasions held in a temple, as Mak Bochea in February, Khmer new year in April, Pik Sak Bochea in May, Chol Vasa in July, Phchom Ben in September, Chegn Vasa in October, and Kathen in October and November. On those occasions, people go to a temple with lunch box to give

monks food, later they share the food among the people after monks eat little by little from all the plates, and they pass a very happy time. Since a temple holds a big compound, it often provides people a place for gatherings.

At each temple, a temple construction committee is formed to construct and rehabilitate buildings of the temple. The committee members are temple caretakers (Achar) represented from villages. After the Pol Pot regime finished, temples were the first to be reconstructed in the villages. Believers donate money for the reconstruction within their capacities. So it happens sometimes that the reconstruction stops on the way because the amount of money collected is not enough to complete. At the same time, the committee works for school buildings, village road rehabilitation, and/or bridge reconstruction. As monks are well respected by the people, a monk acts as a leader of village development very often.

II.5 Strengthening of Farmers' Organization

II.5.1 Approach for Establishment of Farmers' Organization

Several types of farmers' organization are required for efficient agricultural development. It is found in the socio-economic survey too that most of farmers want agricultural cooperative and water users' association in the future. Among them, WUA (Water Users' Association) is the most required organization urgently because water from the reservoirs is the life line to the farmers in the study area. WUA is essential to operate and maintain the reservoirs better than now.

Agricultural cooperative may be organized later because it takes time to establish one with complex objectives. A possibility of agricultural cooperative is to establish producers' cooperative with a single objective on a single crop, for example, grass mat producers' cooperative or lotus seed producers' cooperative in order to take advantage in marketing and in purchasing materials and machines. And women's association is recommendable to help women ease their difficulties, involve women in development, and improve house keeping. Women's association shall be formed in every village, integrated into commune level, then district level. The staff of women's affairs of district shall organize women's association at each village through training of women.

Discussion here is focused on WUA required at most, because development plans in this study are formulated with rehabilitation of the reservoirs and the rural roads. Unless the maintenance of the facilities constructed is done well, they will break in a few years because all the dikes are under water in the late rainy season every year as well as most of the farming lands and fishing lots. The earthen dikes will be eroded with water easily and the water gates will be broken as they are seen everywhere in Cambodia. Therefore, it is a must to form an association to operate and maintain the facilities.

The benefit principle should be put into practice to take care of the facilities because the facilities are of the beneficiaries after they are rehabilitated. And it accords with a government issue on responsible bodies of irrigation system that farmers themselves should operate and maintain them in a small scale irrigation system (less than 200 ha of irrigated area). There are as many as 37 reservoirs in the study area and all of them fall into small scale category.

A manager of each reservoir is working for operation and maintenance at present, but most of them are not so effective that the reservoirs can not keep enough water to draw full capacity out of the plentiful natural conditions in the study area.

Since farmers are not used to farmers' organization, it is hardly expected to establish WUA by

farmers themselves spontaneously. So they should be guided and trained to establish WUA in order to understand it thoroughly at first. Furthermore, many farmers are not well educated and literacy rate is very low. It will be a constraint for farmers understanding what is farmers' organization and how it should be. They may imagine the Khrom Samaki (Collective farm) from farmers' organization formed under socialism in the past.

When an outside organizer is required, it is needless to say that the organizer should be well experienced in organization and its training. The study team learned in the master plan study that there were several NGOs well experienced in establishing farmers' organization in Cambodia. But none of them are working in the study area.

As mentioned above, there is a government policy on water users' association issued in July, 1996 that the GDIMH/MAFF has a role to organize and supervise water users' association in order to manage and operate irrigation system very effectively by farmers themselves. Taking the scale of the existing reservoirs in the study area into consideration, office of agriculture in the district is responsible for organizing WUA in cooperation with the provincial department of hydrology. So It is practical to organize farmers into WUA led by office of agriculture in the district at the beginning.

An officer in charge of organization is the person in charge of hydrology of agricultural office. And he should be well experienced in organization and its training. In case he is not experienced, he should be trained first under a trainer's training for smooth establishment. He needs to persuade water users the necessity to form WUA. However, it is too much task to fill it alone for all the water users of the 37 reservoirs. Therefore, It is recommended to start it with the existing managers, then managers will explain it to their water users.

After the farmers agree to establishment of WUA, they should be led to elect the committee through a democratic procedure. And the managers will not necessarily be a chairperson of WUA. The committee should never be nominated by the authority, because the committee needs to gain the full trust by the members.

Though this method of organization includes a top down procedure partly, it is the most realistic one in the present circumstances. Because it is essential to establish WUA for operation and maintenance of the reservoirs, and it secures farmers' initiative of operation and maintenance when the committees are elected through a democratic procedure. An approach to establish WUA is summarized in the following four stages.

- 1) Training to an officer in charge in a course or by an experienced expert
- 2) Training to the present managers by the officer
- 3) Training to farmers by the managers
- 4) Common consent to establish WUA among the water users

II.5.2 Operation and Management of the Organization

The WUAs planned here are small scale where the number of members is small as well. Therefore, the committee need not to be big either. It is recommended here that each committee will be composed of three persons, a chairperson, an accountant and an operator.

Accountancy should be separated from a chairperson because the finance of WUA should not be in the same hand of a top person and be open to all the members, reflecting that only a manager did everything for management of a reservoir in the past. An operator works for the gates to open and close day by day, and watches the dike often to find any breakage, but maintenance work shall be decided in the committee. The committee members should be paid to make them more responsible on their job, and a motorbike is preferably given to the committee to keep the eyes on the facilities and operation, because the reservoirs are far from their houses.

Female headed farmers shall be treated equally as a member at least, or they should be given some advantages in speaking in the meetings, water charge or labor contribution for maintenance, because women contribute to agriculture a lot, yet they are underprivileged socially.

After WUA is established, it is important to operate and manage the organization well. WUA should be managed by the members themselves. The followings are prerequisites for good operation and management of WUA.

- 1) The committee members of WUA shall be elected by the water users of the reservoir through a democratic procedure.
- 2) Chairperson should be trusted personally, especially on money.
- 3) WUA should create its own regulations on the organization and water use.
- 4) Members of WUA shall pay water charge necessary for operation, management and maintenance, which should be written in the regulations.
- 5) WUA shall set up a hall to meet and a storehouse of machines, spare parts and records. In this plan, a central office will be set up at the district for all the WUAs in the study area.
- 6) The committee members shall be remunerated in reasonable amount.
- 7) Special consideration should be taken to female headed household.

Among the prerequisites, three points, i.e., chairperson, regulations of organization and water charge are key points to lead a WUA successful.

A chairperson holds the key of WUA. In other words, it depends on the chairperson whether a WUA is successful or not. Therefore, the chairperson should be elected in a democratic procedure among the members of WUA. Because the chairperson needs the trust from the

members to fill his duties as making decision on the gate operation, mediation on water disputes, maintenance work, etc. The other two committee members, an accountant and operator, should be elected, too.

Regulations are another important factor to be successful for an organization in order to be fair among the members. Whenever there are disputes or difference on ideas, the regulations are the basic points that the members solve the problems. There are many types of regulations, but clear and simple regulations are recommendable. Each WUA may decide its own regulations by themselves. If there are any difficulties to formulate regulations, model regulations may be proposed by agricultural office to WUA, and they may be reformed to fit to each WUA by the members.

Water charge should be collected to maintain the facilities, because the finance was the biggest constraint to maintain the reservoirs in the past. The water users will benefit from the rehabilitated reservoirs, and they gain much more profit than water charge. The water charge may be paid in terms of rice and not necessarily of money. As an example, a WUA in Takeo Province collects 230 kg of rice per ha for direct irrigation and 160 kg for indirect irrigation. WUA can sell the rice they collect from the members whenever necessary. The collected fund shall be spent quickly for rehabilitation of the facilities when damages are small yet. Because it was often too late to do it until the damage was too big to rehabilitate in the past.

After all, it is most important for the water users to be conscious that the reservoir should be maintained not by anyone else but by themselves. All the decisions on maintenance should be entrusted thoroughly to the committee. If there occur serious problems beyond capacity of the committee, general meeting shall be held to find a solution.

II.6 Proposal of Operation and Maintenance Supporting Office

II.6.1 Objectives of Operation and Maintenance Supporting Office

In this plan, all the water reservoirs will form WUAs under a guidance of agricultural office of the district to maintain the reservoirs better than now. WUAs will reach as many as thirty seven. Each WUA will be a small association because the water reservoirs are small scale.

All of WUAs are not experienced, nor most of the existing managers maintained the reservoirs well in the past. Therefore, it is necessary to guide WUAs to run smoothly after they are formed. WUAs also need technical advice on water management of the total water uses of a reservoir and maintenance work of the dikes and the water gates.

As all the WUAs are small, it is better economically to hold an office to support all the WUAs

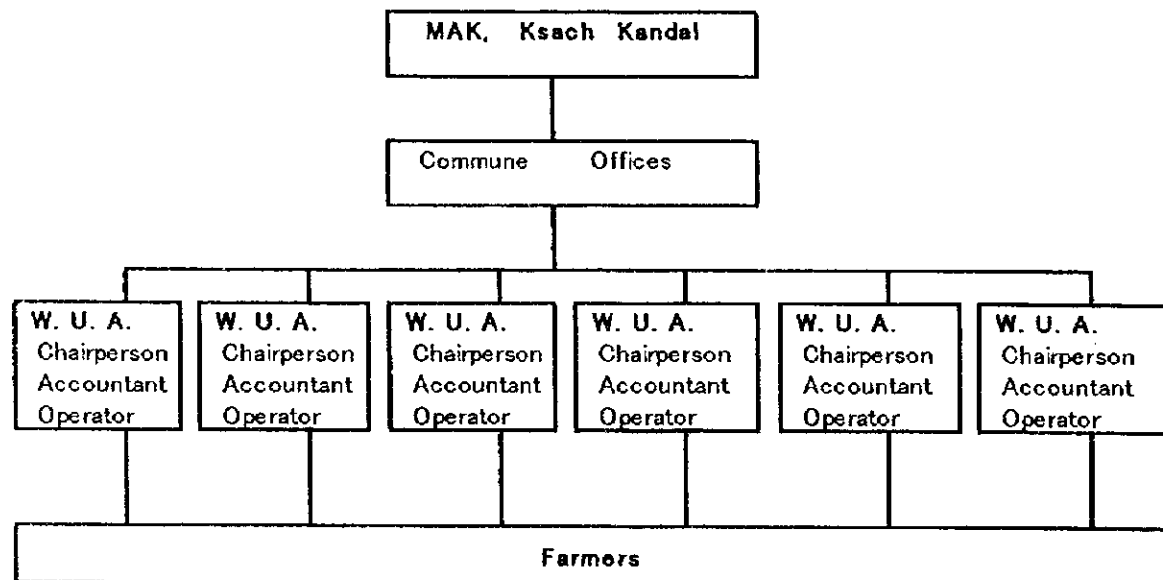
technically and storehouses to keep pumps, machines and spare parts than each WUA has a hall and a storehouse separately. The supporting office will be set up at the district central of Ksach Kandal equipped with a hall, offices and storehouses. The supporting office will be named MAK, Ksach Kandal (Machamundul Aphivoet Kahsehkam Neung Toek in Cambodian language, Agricultural and Water Development Office in English).

But the district central is a bit far from the lower part of Puk Reussei commune and Prek Ampil commune on the left bank of the Mekong, and Vihearsour commune and Sanlung commune. So two storehouses shall be added, one at Puk Reussei commune and another at Vihearsour commune to keep pumps, machines and spare parts.

The function of the supporting office is to give necessary advice to WUAs, to provide a hall for WUAs to hold meetings and various training on organization, water uses, agriculture, etc., to lend pumps and machines, and to supply spare parts. The hall may also provide opportunities of training to women as well on sewing, dress making, hair dressing, living improvement, etc.

II.6.2 Operation of Office

An organization of each WUA is a simple one composed of only three committee members, but all the WUAs are integrated into MAK, Ksach Kandal through commune offices. The system is shown in the following organization chart.



Organization Chart of Operation and Maintenance of Reservoirs

The supporting office shall be managed by agricultural office, Ksach Kandal district. As the office of agriculture is too small at present, it is recommended to move all the functions of the agricultural office to the supporting office, hence it will be actual agricultural office of Ksach Kandal district, though the supporting office needs to add several rooms for the other agricultural office.

Each WUA shall be managed financially with the money collected from the members. And the supporting office shall be managed with the district government especially on personnel but revolving fund shall be collected through renting pumps and machines.

This development plan shall work to the other areas as a model of agricultural development. In order to build an institution well at the beginning as a model, it is recommended to call for Japanese experts and/or volunteers in the field of water management, agriculture and machines. They form a team to make the system running smoothly for the first five years. The services will be transferred to Cambodian staff gradually and all the services will be in the hands of Cambodians after five years. The security in the study area is good enough for foreigners to work, and even to live, though possible to commute from Phnom Penh everyday.

II.6.3 Proposed Facility and Machine/Equipment

As mentioned above, the supporting office needs facilities and equipment to function as it is designed. The followings are the list of necessary facilities and machines/equipment.

(1) Facility

- Hall 1 (good for 200 people)
- Office..... 1 (5 rooms)
- Storehouse..... 5 (3: MAK, 1: Puk Reussej, 1 : Vihearsour)

(2) Machine/Equipment

- Office equipment.....10 desks with chairs, 70 long tables, 200 folding chairs,
5 white boards, 12 office cabinets
- 4-wheel drive wagon..... 1
- Motorbike40 (37 WUAs + 3 at the office)
- Water pumps (portable).....111 (3 pumps x 37 WUAs)
- Tractor..... 5 (1 x 5 communes)
- Hand tractors.....15 (3 x 5 communes)
- Grass cutter.....15 (3 x 5 communes)
- Back hoe.....1
- Bulldozer..... 1
- Dump truck.....1

A hall will be used to hold meetings of WUAs and various training, and is capable to gather 200 people at once with long tables and chairs good for 200. An office building with 5 rooms will be the supporting office and agricultural office of Ksach Kandal district, and it needs office equipment, 2 sets of desk and chairs in a room, and 2 office cabinets each. The rest two cabinets will be equipped at the hall. White boards will be used for training. Three storehouses at MAK are planned, two for tractors and hand tractors, one for pumps. A storehouse will be built at Puk Reusseï commune and another at Vihearsour commune.

4-wheel drive wagon is required to go around the whole area where roads are not paved. A motorbike is needed for each WUA to operate the gates daily and to keep eyes on the dikes which are located far from residence. Three motorbikes will be used by the staff of agriculture of the district. Three pumps will be equipped at each WUA, but they shall be kept at the designated storehouse when they are not used, and WUA shall pay their rental fee fixed later to MAK when used to revolve the fund. Five middle tractors will be equipped for rent, one for a commune, and 15 hand tractors for rent and 15 grass cutters as well. Constructing machines as a back hoe, a bulldozer and a dump truck are meant for maintenance of dikes and roads.