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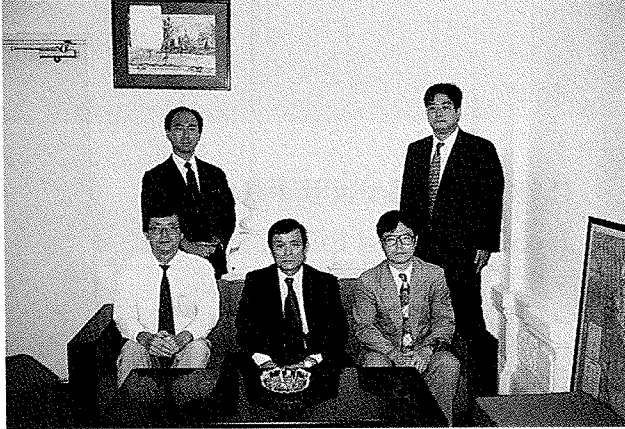
**Report on the Basic Survey on Agricultural  
and Rural Development by  
Progress Stage in Asian Countries**

**—KINGDOM OF CAMBODIA—**

**Focus on  
Battambang and Kandal**

**MARCH 1999**

**The Asian Population and Development  
Association**



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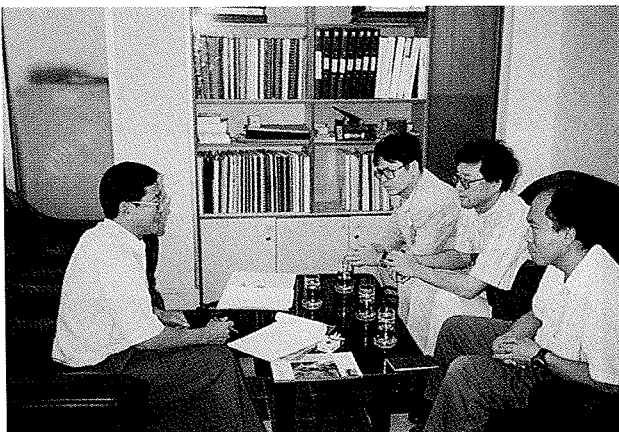
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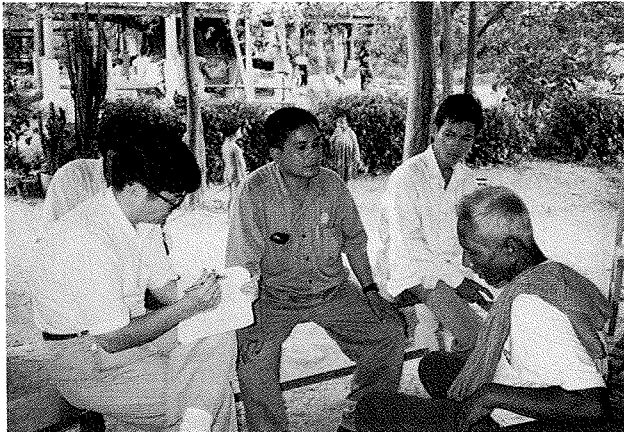
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Sangke river,  
Near by the surveyed village. Water level is  
much below the cultivate land level



Colmatage irrigation gate at surveyed  
village at Kandal

# Foreword

This report presents the results of the “Basic Survey on Agricultural and Rural Development by Progress Stage in Asian Countries”, a project implemented in The Kingdom of Cambodia by the Asian Population and Development Association (APDA) under the consignment from the Ministry of Agriculture, Forestry and Fishery in 1998. The survey and compilation of the results were mainly carried out by the member of survey committee of APDA (Chairperson: Dr. Shigeto Kawano, Professor Emeritus, the University of Tokyo).

The objective of this survey was as follows: “In extending assistance for agriculture and rural development to Asian countries, it is necessary to identify the areas in which agricultural and rural development assistance is to be offered, the form in which it is offered and the regions to which it is offered in accordance with stages of development in keeping with the country’s policy issues for overall promotion and improvement of rural areas while taking structural changes in population and employment into consideration, in an effort to form the foundation for offering effective and efficient assistance”.

For this purpose, survey will be conducted by selecting model and regions from Asian countries to study the form of agricultural and rural development according to structural changes in population and employment, thereby contributing to policy dialogue regarding agricultural and rural development. The field survey in the Kingdom of Cambodia was conducted with the guidance and cooperation of: Mrs. Ky Lum Ang, M.P., Ministry of Foreign Affairs and International Cooperation of the Kingdom of Cambodia; Ministry of Agriculture, Forestry and Fishery; and Mr. Masaki Saito, Ambassador of Japan; Mr. Yoichi Kakita, First Secretary of the Embassy of Japan, and other cooperators.

In Japan, guidance regarding the content of the survey and assistance in arrangement of field survey were offered by the International Cooperation Planning Division, Economic Affairs Bureau, the Ministry of Agriculture, Forestry and Fisheries. And Mr. Troung Meary, Former Ambassador of Cambodia to Japan who had left his position at the end of February, 1999 had done over all arrangement for field survey in Cambodia. I would like to take this opportunity to extend my deepest gratitude for their support.

I sincerely hope that this report will contribute to the advancement of the rural community and agricultural development programs in the Kingdom of Cambodia and support effective assistance by the Japanese Government in this country.



Lastly, I would like to note that this report has been compiled under the sole responsibility of APDA and does not necessarily reflect the view or policies of the Ministry of Agriculture, Forestry and Fisheries or the Japanese Government.

March 1999

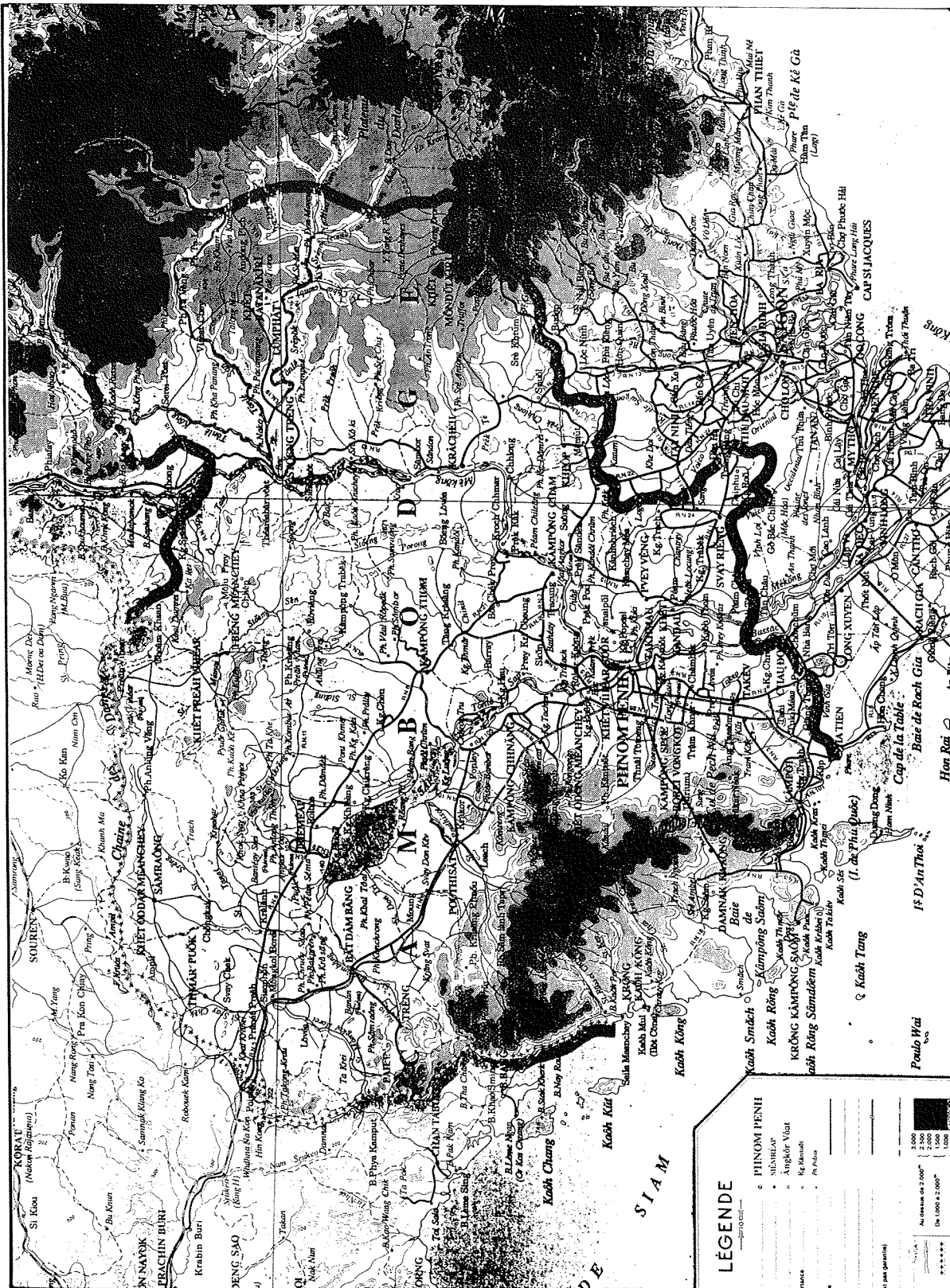
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# Topography of Cambodia



**LÉGENDE**

Capitale d'Etat	• PHNOM PENH
Chef-lieu de province	• SIEHREAP
Centre important	• ANGKOR VIEAT
Localité de moyenne importance	• KG KANAL
Aura habitée	• Ph. P. P. S.
Routes asphaltées ou bitumées	
Routes non asphaltées	
Frontière internationale	
Point de base	
La vallée des rivières (à des pentes)	
Chemin de Fer	
Méridien de Greenwich	
Hauteur hydrographique	
Limite d'Etat	
Altitude sans garantie pour la navigation aérienne	

**Échelle**

Au-dessus de 2 000' : 3 000, 2 000, 1 500, 1 000, 500, 200, 0

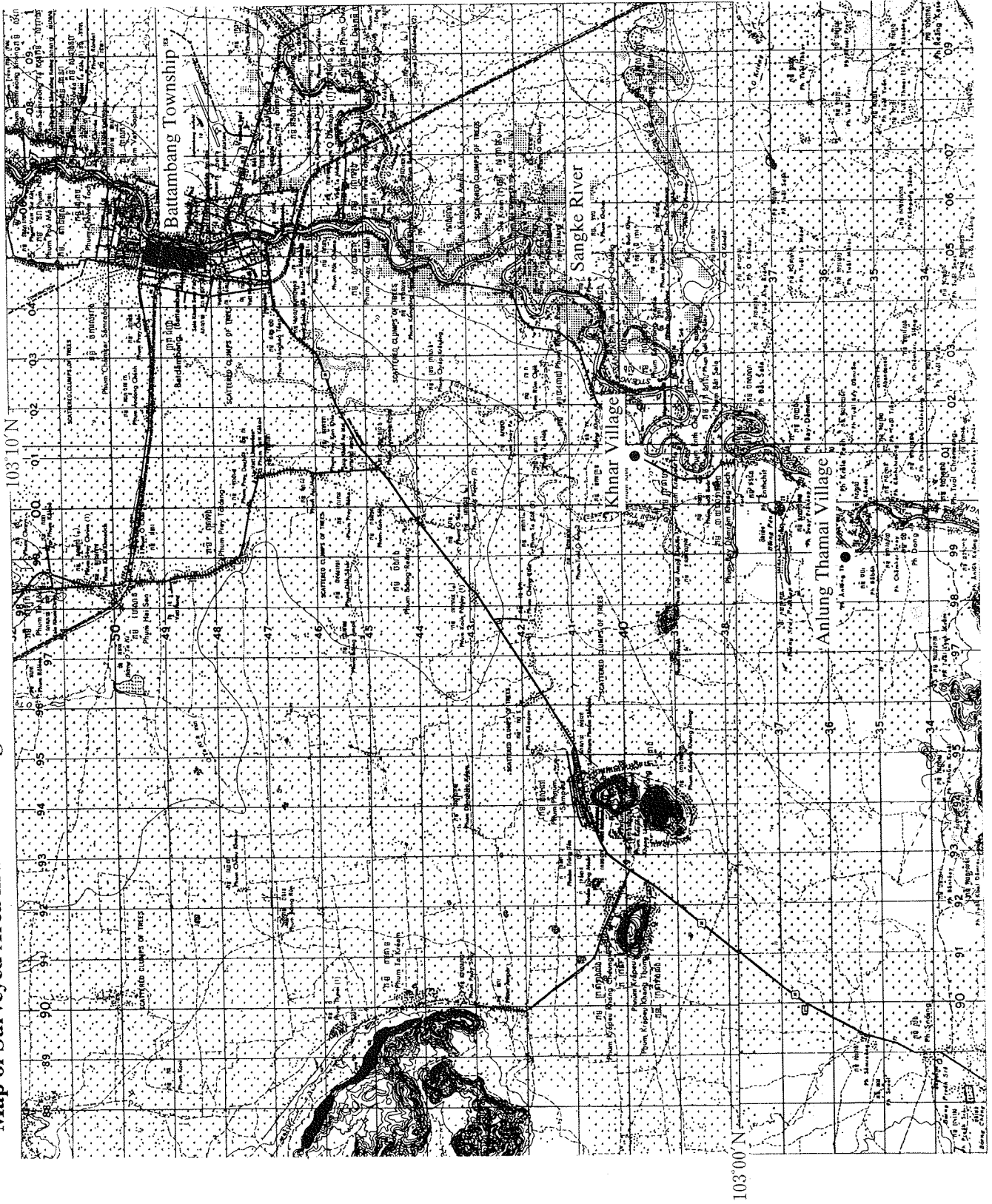
De 1 000 à 2 000' : 1 000, 500, 200, 0

De 200 à 1 000' : 200, 0

De 0 à 200' : 0

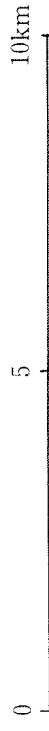


Map of Surveyed Area in Battambang Province



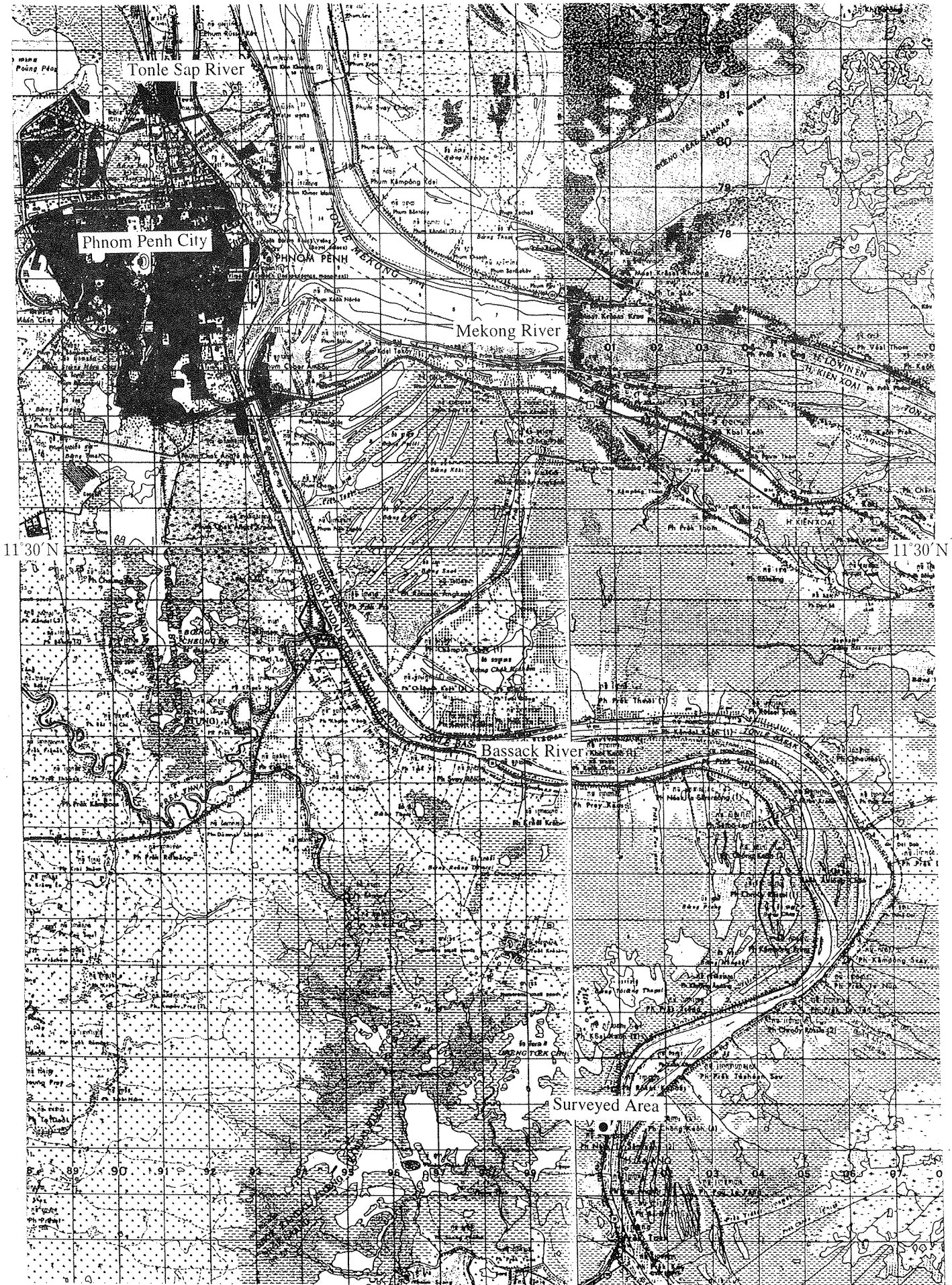
13°00'N

103°00'N



# Map of Surveyed Area in Kandal Province

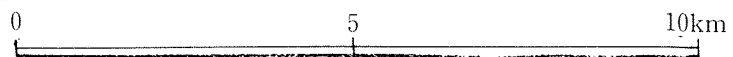
105°00E



11°30' N

11°30' N

-9-



# Chapter One

## Outline of Cambodian Agriculture

### 1. Present Condition of Agriculture and Development

#### (1) Outline

##### 1) Land use

An outline of land use in present day Cambodia is shown in Table 1-1 in the form of results obtained by analyzing a satellite image. According to these results, 22% of land is cultivated as farmland with paddy field accounting for about 15% and fields (including rubber plantations and orchards) accounting for about 7%. Further, the percentage of each land category in the entire farmland is shown in Table 1-2.

Firstly, we see that paddy field (including low water season paddy and floating rice) accounts for nearly 70% of all farmland area.<sup>1</sup> As shown in Figure 1-1, the majority of these paddies are concentrated in areas that are 30 meters above sea level.

The next most common form of farmland are fields built on natural banks that had developed along the natural banks of the Mekong River, the Tonle Sap River and the Basak River which is located south of Kratie. These fields are used for growing cash crops such as vegetables, maize, mung bean, soybean, sugar cane, sesame and tobacco.

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<sup>1</sup> See Hisashi Kawai:1996, "Fudo to Chiri," in Kakio Ayabe and Yoneo Ishii (eds.): "Motto Shiritai Kanbojia,"Kobundo, pp.58-60, for accuracy and problems related to this data.

Then there are fields classified as slope fields which are located mostly in regions that are not directly affected by floods from river water, i.e. outside of the paddy field region. Crops grown here include dry field rice, cassava, jute and peanut.

Slash and burn farming is practiced by minorities mostly in the high forest regions of Rattanakiri and in the eastern side of Kravan Mountains from Battambang Province to Pursat Province.

Rubber plantations account for a little less than 2% of all farmland and are situated mostly in the red soil region of Kampong Thom Province.

While fruits are grown abundantly in Cambodia, orchards that can be recognized from satellite photo are very few because most fruit trees are planted in farm household gardens. A few large orchards of cashew nuts and banana are found in Kampong Thom Province only.



**Table 1-1 Land Use in Cambodia by Landsat and Their Percentage in National Land (1992)**

	Area (km <sup>2</sup> )	Percentage (%)
Cities and their suburbs	45	0.02
Paddy fields	26,097	14.38
Recession rice fields, floating rice	293	0.16
Subtotal	26,390	14.54
Sloped fields	4,665	2.57
Slash-and-burn	1,856	1.02
Orchards	188	0.10
Rubber plantations	746	0.41
Fields on natural levees in flooded areas	5,299	2.92
Subtotal	12,754	7.03
Evergreen forests	47,633	26.24
Conifer forests	98	0.05
Deciduous tree forests	43,012	23.69
Mixed forests	9,773	5.38
Secondary forests	5,170	2.85
Subtotal	105,686	58.22
Flood forests	3,707	2.04
Secondary flood forests	2,598	1.43
Mangrove forests	851	0.47
Subtotal	7,156	3.94
Thin forests	6,563	3.62
Bush forests	13,501	7.44
Bush forests in abandoned farmland	2,528	1.39
Thin forests in marshes	14	0.01
Subtotal	22,606	12.45
Prairies	24	0.01
Savannas	468	0.26
Flooded prairies	849	0.47
Prairies in abandoned farmland	1,095	0.60
Swamps	15	0.01
Subtotal	2,451	1.35
Water surface	4,111	2.26
Wilderness	336	0.19
Subtotal	181,535	100.00

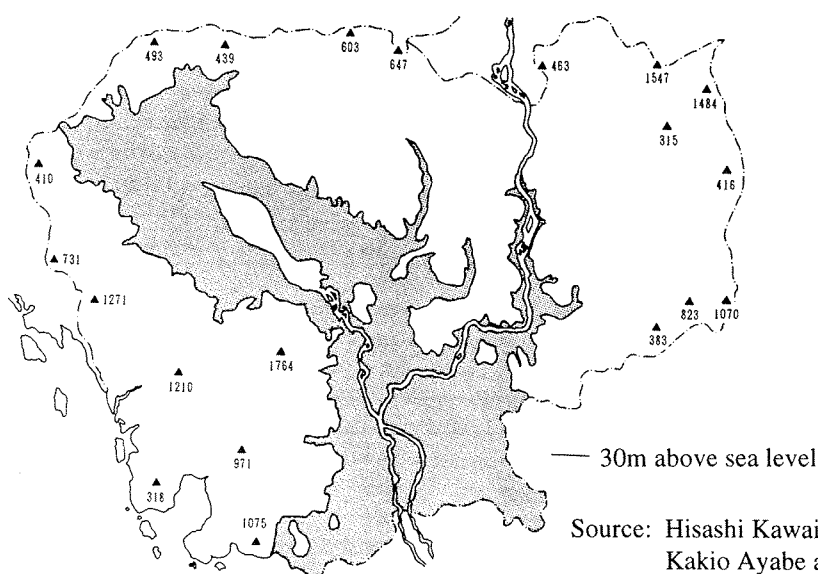
Source: KAWAI, Hisashi (1995) Analysis of Land Cover Atlas by Landsat in Cambodia, Annex 1.  
Percentage against national land calculated by the author.

**Table 1-2 Percentage of Each Farmland Category in Total Farmland Area (1992)**

	Area (km <sup>2</sup> )	Percentage (%)
Total farmland area	39,144	100.0
Rice paddy	26,097	66.7
Recession rice fields/floating rice fields	293	0.7
Sloped fields	4,665	11.9
Slash and burn	1,856	4.7
Orchards	188	0.5
Rubber plantations	746	1.9
Fields built on natural levees in flooded areas	5,299	13.5

Source: Calculated by the author from Table 1-1

**Figure 1-1 30 meter contour lines of above sea level and elevation of main mountains**



Source: Hisashi Kawai, (1996), "Fudo to Chiri," in Kakio Ayabe and Yoneo Ishii (eds.): "Motto Shiritai Kanbojia," Kobundo

## 2) Condition of agricultural production

Table 1-3 shows the harvested area for each crop. Assuming that field crops included in these statistics comprise all field crops cultivated in Cambodia, total harvested area will amount to 2.13 million hectares, of which 90.5% are used for growing rice. While the percentage of rice producing area will slightly be lower because of the existence of crops other than rice that are not included in these statistics (e.g. bananas, rubber, fruits, rush), there is no doubt that rice cultivation area accounts for nearly 90% of the entire cultivated area in Cambodia.

**Table 1-3 Harvested Area by Crop (1997) Unit: ha**

Province*	Rice	Field crops total	Maize	Cassava	Sweet potato	Vegetables	Mung bean	Sugar cane	Soybean	Groundnuts	Sesame	Tobacco	Jute
Phnom Penh	8,839	2,278	805	-	-	1,400	-	-	-	-	7	-	66
Kandal	83,023	23,618	10,156	170	1,048	4,531	4,131	1,197	-	1,390	125	856	14
Kampong Cham	173,020	83,455	6,985	2,701	879	6,870	10,165	1,281	28,620	1,974	10,495	13,461	24
Svay Rieng	162,849	1,798	153	761	170	634	-	80	-	-	-	-	-
Prey Veng	219,491	8,635	2,165	448	120	1,468	1,477	137	-	1,137	1,406	277	-
Ta Keo	222,129	5,182	387	855	406	2,031	415	211	-	812	15	50	-
Kompong Thom	121,551	10,789	1,348	1,472	312	1,483	1,871	134	3,169	550	450	-	-
Siem Reap	179,875	5,920	815	1,335	420	1,740	480	190	-	-	940	-	-
Battambang	139,283	7,199	790	119	484	120	2,185	203	454	1,135	60	-	1,649
Banteay Meanchey	129,400	3,884	1,710	606	260	514	280	266	-	110	50	-	88
Pursat	74,628	3,269	487	300	334	721	517	419	-	358	125	8	-
Kampong Chhnang	93,777	10,277	1,575	603	647	2,505	3,731	447	-	309	209	142	109
Sihanouk Ville	7,750	347	0	155	10	157	-	25	-	-	-	-	-
Kep	2,594	1,785	566	145	84	645	5	-	-	340	-	-	-
Kam Pot	141,120	10,691	850	150	785	7,185	196	1,201	-	299	25	-	-
Koh Kong	7,340	4,605	1,810	1,090	1,415	-	-	85	-	198	7	-	-
Kompong speu	80,168	3,772	299	382	65	705	1,200	500	-	521	100	-	-
Preah Vihea	15,755	3,022	1,700	211	705	273	47	35	-	35	16	-	-
Stung Treng	8,913	2,599	511	20	84	675	206	805	-	112	86	100	-
Rattanakiri	18,939	4,375	490	650	345	495	245	403	465	112	1,170	-	-
Mondulkiri	6,185	1,167	290	349	305	120	46	57	-	-	-	-	-
Kratie	32,060	3,093	246	450	266	749	220	359	31	110	612	50	-
Total	1,928,689	201,760	34,138	12,972	9,144	35,021	27,417	8,035	32,739	9,502	15,898	14,944	1,950

\*Phnom Penh and Sihanouk Ville are special districts

Source: Prepared by the author based on Agricultural Statistics 1997-98, ministry of Agriculture (date of issue unknown)

## **i) Rice**

Rice is grown in dry season and rainy season in Cambodia. However, this does not mean that double-cropping is practiced on the same paddy in dry season and rainy season. It is the result of two types of paddy field that exist in this country—there is paddy field that can be planted in rainy season (rainy season paddy) and paddy field that can be planted in dry season (dry season paddy<sup>2</sup>) due to the relationship with floods caused by running river water from the Mekong River. In addition, double-cropping is very limited as irrigation remains undeveloped to present day. Therefore, one can safely conclude that the rule of rice cropping in Cambodia is that rice planting can only be performed once a year on the same paddy.

Table 1-4 illustrates harvested area, yield and unit yield during dry season and rainy season for each province and Table 1-5 shows the percentages of rainy season rice cropping and dry season rice cropping in total annual harvested area and total yield in each province. According to this table, rainy season rice cropping accounts for 87.3% of total annual harvested area and 78.3% of total yield while dry season rice cropping accounts for only 12.7% of total annual harvested area and 21.7% of total yield when seen in terms of national average. Nevertheless, it shows that dry season rice cropping plays an important role in provinces that have back marshes of the Basak River and the Mekong River (Kandal, Kampong Cham, Prey Veng, Takeo).

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2 Incidentally, this “dry season paddy” is not synonymous with “low-water season paddy/floating rice” which is a land classification category used in the study using satellite that was mentioned in the previous section. The definition of “low-water season paddy/floating rice” in this study is “rice cropping performed after the water level drops at Lake Tonle Sap (traditional rice cropping in Cambodia practiced in the surrounding areas of Lake Tonle Sap) and floating rice.” Therefore, only the coastal areas of Lake Tonle Sap in Battambang, Siem Reap, Kampong Chinnang, Kampong Thom and Pursat Provinces are interpreted to fall into this category. Since the author is using “dry season paddy” as a term that includes all rice paddies that are planted during the dry season, “dry season paddy” referred to in this report would signify a broader concept that also includes “low-water season paddy/floating rice.” In addition, “dry season paddy” built on back marshes of the Mekong River would be included in “paddy field” in the quoted satellite study.



**Table 1-4 Harvested Area, Production and Unit Yield of Rice (1997)**

Province*	Rainy season			Dry season		
	Harvested area (ha)	Production (t)	Unit yield (t/ha)	Harvested area (ha)	Production (t)	Unit yield (t/ha)
Phnom Penh	7,689	13,071	1.7	1,150	2,875	2.5
Kandal	36,023	70,343	2.0	45,000	143,530	3.2
Kampong Cham	143,820	240,179	1.7	29,200	86,694	3.0
Svay Rieng	150,889	179,558	1.2	11,960	32,445	2.7
Prey Veng	160,476	232,690	1.4	59,015	202,370	3.4
Ta Keo	162,029	405,073	2.5	60,100	180,487	3.0
Kompong Thom	118,253	135,991	1.2	3,298	7,113	2.2
Siem Reap	170,175	205,912	1.2	9,700	29,100	3.0
Battambang	136,643	219,995	1.6	2,640	6,726	2.5
Banteay	129,250	165,440	1.3	150	450	3.0
Meanchey						
Pursat	74,528	143,839	1.9	100	234	2.3
Kampong	83,627	141,330	1.7	10,150	33,069	3.3
Chhnang						
Sihanouk Ville	7,750	13,175	1.7	-	-	-
Kam Pot	136,500	253,890	1.9	4,620	-	-
Koh Kong	7,340	11,230	1.5	-	-	-
Kompong speu	79,368	116,671	1.5	800	2,480	3.1
Preah Vihea	15,755	23,947	1.5	-	-	-
Stung Treng	8,913	14,172	1.6	-	-	-
Rattanakiri	18,939	29,355	1.5	-	-	-
Mondulkiri	6,185	9,711	1.6	-	30	-
Kratie	26,160	42,641	1.6	5,900	14,750	2.5
Kep	2,594	4,384	1.7	-	-	-
Total/Average	1,682,906	2,672,597	1.6	243,783	742,353	2.8

Source: Same as Table 1-3

## ii) Field crops

Condition of cultivation for major field crops is already shown in Table 1-3. According to this table, crops that are consumed without any processing (maize, cassava, sweet potato, vegetables, mung bean, sugar cane) are grown nationwide while producing centers of craft crops such as tobacco and soybean are limited. In addition, "field crops total" on the third column of Table 1-3 shows the total harvested area for each province listed from the fourth column onward. According to these figures, Kampong Cham Province has abundance of fields. Field area in this province accounts for 41.4% of the national total.

## **(2) Agricultural productivity**

### **1) Unit yield**

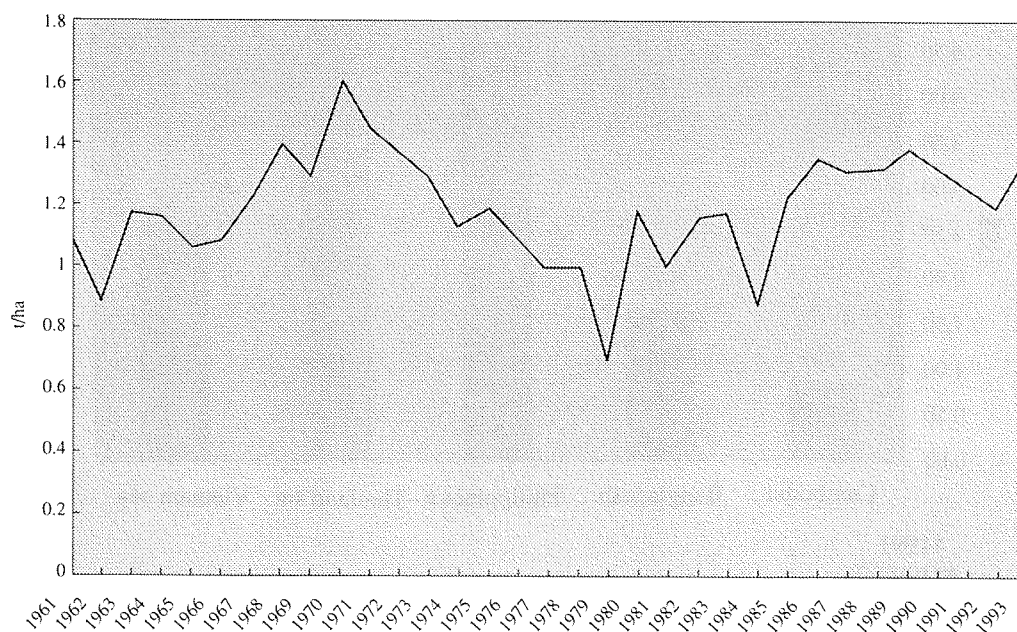
Agricultural productivity is low in Cambodia. One of the factors is her relatively sparse population, which is about one-fourth of Vietnam and one-half of Thailand. There was room left for reclamation until very recently and therefore the country was lacking the necessity to increase her unit yield. However, there were more direct causes including: 1) destruction of the production base for not only industry but also agriculture by the civil war that lasted from 1970 to 1975 and the “policy” implemented from 1975 to 1978 by the Pol Pot Regime; 2) the need to tackle the rehabilitation of the devastated country that was placed under extremely severe financial limitations for a period of nearly 10 years from 1982 to 1992 when People’s Revolution Party adopted a measure prohibiting development aid from the United Nations and western countries; and 3) stagnation that was forced upon agricultural technology for a period of 30 to 40 years since the ‘60s as a result of such historical background.

The productivity of rice cropping, which accounts for about 90% of total harvested area in Cambodia, will be explained below.

Figure 1-2 shows the changes in unit yield of unhulled rice over the last 30 years. In the ‘60s, unit yield was showing a clear trend of increase, although there were some yearly fluctuations due to poor crop. From 1970 onward, however, unit yield turned to decline. After marking the lowest level in 1979 immediately after the collapse of the Pol Pot Regime, several years of extreme instability continued and stability was not regained until the mid-‘80s. Thus unit yield has recovered in the recent years to the level slightly exceeding the level of the early ‘60s.

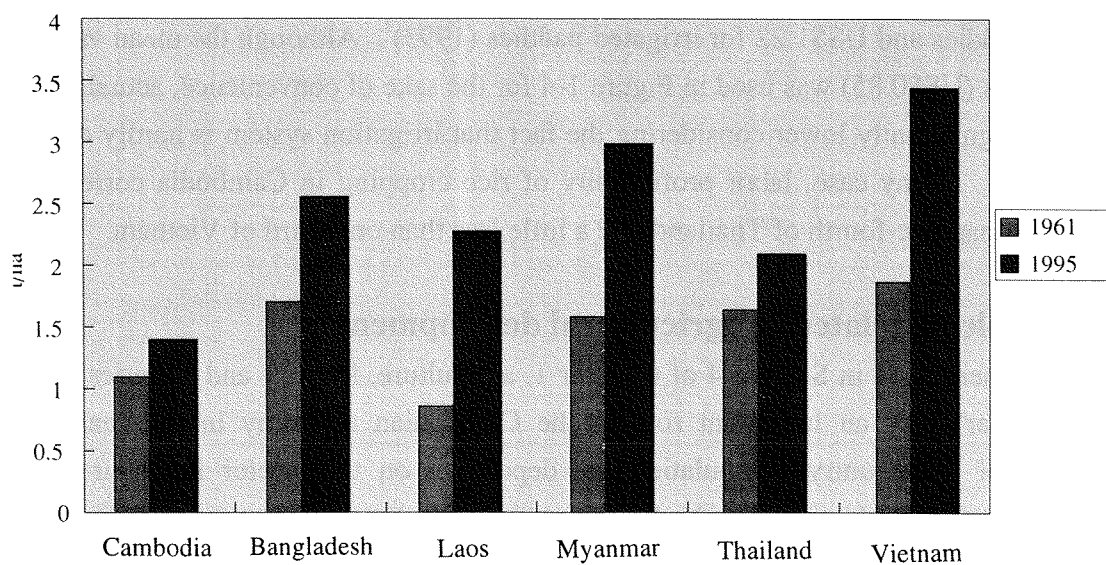
However, unit yield of rice in Cambodia is extremely low compared to her neighboring countries that consume rice as staple food (Figure 1-3). Moreover, unit yield is not only low at present but has hardly increased in the last 30 years.

**Figure 1-2 Changes in Unit Yield of Seed Rice**



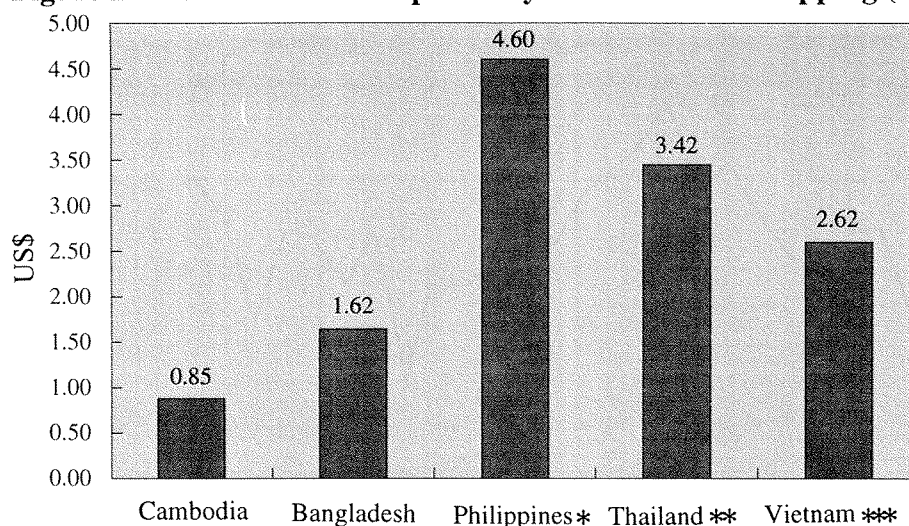
Source: Prepared by the author based on IRRI (1995), World Rice Statistics 1993-94

**Figure 1-3 Changes in Unit Yield of Seed Rice (comparison by country)**



Source: Same as Figure 1-2

**Figure 1-4 Net Added Value per Daily Labor in Rice Cropping (1993)**



\*1991

\*\*1992-93

\*\*\*1992

Source: Same as Figure 1-2

## 2) Labor productivity

Rice cropping in Cambodia is characterized by very low profitability in addition to low unit yield. Added value per working day for rice cropping in Cambodia is US\$ 0.47 for rainfed paddies and US\$1.22 for irrigated paddies (1993)<sup>3</sup>. Although the mean value of these two figures (US\$0.85) was used in Figure 1-4 for the sake of convenience, actual profitability must be significantly lower considering the fact that irrigation system is hardly developed in Cambodia. In any case, labor profitability of rice cropping in Cambodia corresponds to a little less than one-fourth of Thailand and a little less than one-third of Vietnam.

## (3) Problems related to agricultural development

As mentioned in Section 4 of Chapter 1, agriculture, forestry and fisheries (agriculture in particular) play an important role in the Cambodian economy in the sense that vast majority of the country's population are dependent on this sector for their sustenance. Nevertheless, agriculture in Cambodia has stagnated in the recent years and its ratio against GNP has decreased by large margin. Therefore, there is an important task of advancing agricultural development while promoting industrial development that has finally reached its starting point at the same time. However, the Cambodian economy is still troubled by the unfavorable conditions that originated from the long period of war; social disturbance has continued since the '70s and still hinders the country's development. The greatest hindrances

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<sup>3</sup> IRRI (1995), World Rice Statistics 1993-94, p.232.

to agricultural development in Cambodia include the land mine problem, stagnation of agricultural technology and deficient economic infrastructure and distribution system.

### **1) Land mine problem**

It was in the end of the '60 s that land mines were used for the first time in Cambodia. As a result of being laid indiscriminately for a period of more than 20 years since that time, almost the same number of land mines are believed to have been laid in Cambodia as the number of her population.

Areas charged with land mines are concentrated in the northwestern region along the Thai border and continue to the southeastern coast along the mountain region. Since few land mines are found in the central plain region, the percentage of arable land for rice cropping charged with land mine is estimated at only 1.77%<sup>4</sup>. Therefore, the likeliness of land mine becoming an obstacle to development of rice cropping is believed to be fortunately low on the whole, although it is also true that it is still a serious limiting factor in some regions.

### **2) Stagnation of agricultural technology**

As mentioned earlier, it must be said that agricultural technology in Cambodia have stagnated and has achieved very little development since the '60s. Agriculture in Cambodia was completely left behind from the development of agricultural technology that was taking place in rest of the world. The war and social disturbance that occurred in the '70s and the state of international isolation that the country put itself in the '80s left the Cambodian agriculture completely behind from the development of agricultural technology that occurred in the meantime. Under the present cultivation technology, any attempt to commercialize farm produce including rice will be accompanied by considerable difficulty in terms of quality and specifications.

### **3) Lack of economic infrastructure and distribution system**

No new construction or repair of economic infrastructure were undertaken in Cambodia during the period from its destruction by the civil war in the first half of the '70s to the conclusion of the Paris Peace Agreement in October 1991. While minimum repair work has started since 1992 through assistance from foreign countries, the infrastructure remains in an extremely poor condition.

In addition, the present distribution system in Cambodia expanded and developed under

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4 International Agriculture and Forestry Cooperation Association: 1997, "Agriculture and Forestry in Cambodia: Present Condition and Tasks of Development," p.72

a de facto laissez-faire system from what had rehabilitated spontaneously after the collapse of the Pol Pot Regime. Therefore, it is strikingly characterized by its lack of institutional framework (e.g. establishment and application of quality standard, collection and propagation of price information) which is normally be equipped by the administration. For this reason, creation of a distribution system including construction of transportation network and improvement of the system will become the foremost task in addition to merely increasing production as the country strives to commercialize her farm produce and commence rice export.

#### **(4) Agricultural development policy**

The Cambodian Government is currently engaged in two national projects; National Programme to Rehabilitate and Develop Cambodia, which sets long-term comprehensive goals, and The First Socioeconomic Development Plan 1996-2000, which sets more concrete mid-term goals towards the achievement of such comprehensive goals.

As for agricultural development, “Strategic Plan 1997-2001” was published by the Ministry of Agriculture in 1997. This plan is positioned as “a substitute for Chapter 10 of the First Socioeconomic Development Plan (the chapter referring to the agricultural sector).” For this reason, the following description will be offered according to the “Strategic Plan 1997-2001.”

##### **i) The roles of Ministry of Agriculture**

Based on an understanding that the roles to be played by government agencies have changed as a result of shift in economic system from controlled economy to market economy, the following points have been raised as the new roles to be played by the Ministry of Agriculture.

- 1) Offer advice to the government with regard to policy matters concerning the agricultural sector
- 2) Offer information based on the results of study and research
- 3) Offer information to farmers, agrobusiness and community
- 4) Lay down rules that are indispensable for protecting farmers, consumers and the environment

## **ii) Goals**

“Strategic Plan 1997-2001” maintains that, while it is natural for the percentage held by agriculture in GDP to become lower with the growth of the economy, it is important to contribute to the overall growth of GDP by increasing the total value of farm produce in the light of its importance in the Cambodian economy and the fact that other industries are still in their initial stage of development. It therefore sets its main goal on raising agricultural sector’s GDP growth rate during the period of this plan to 4.5% in yearly average.

## **iii) Program**

Thirteen programs that were prepared in accordance with the existing department structure have been presented as means for improving agricultural production capacity towards the achievement of the aforementioned goal. The objectives of each project will be outlined in the following.

- a. Cultivation skill improvement program  
Meet people’s demand and provide the materials for processed farm produce by increasing production of fruit trees, grains, beans and vegetables.
- b. Livestock program  
Increase productivity of livestock breeding by controlling livestock diseases to improve the nutritional condition of farm households, create source of cash income and improve productivity of draft animals.
- c. Water resource management program  
Manage water resources through development and repair of reservoirs, waterways and wells while conducting collection, analysis and offering of meteorological information and coordinating irrigation projects.
- d. Fisheries program  
Enable fishery activities to be conducted in a sustainable manner. Also supply more protein source to the people by increasing seafood production.
- e. Forestry program  
Realize management of forest resources that would secure environmental sustainability, community profit and wildlife protection while maximizing economic profit at the same time.
- f. Farm produce market service program  
Aim for collection, analysis and offering of data concerning market price of main agricultural inputs and farm produce.



- g. Rubber production program  
Rehabilitate national rubber plantations and increase the productivity of small rubber farm households.
- h. Input offering program  
Enable purchase of agricultural inputs conforming to international quality standard at adequate prices throughout the country.
- i. Agricultural extension program  
Improve productivity and enable farmers and others to obtain information suited for promoting their self-help efforts.
- j. Agricultural education program  
Create systems for vocational training and higher education that would meet the needs of the Cambodian agriculture.
- k. Land management program  
A newly created program for impartial and sustainable utilization of land resources.
- l. Policy and plan preparation program  
Coordinates all programs within the Ministry of Agriculture and makes policy proposals in connection with the agricultural sector.
- m. Common program  
Offers timely and adequate advice to other programs in line with the government policy to improve their results.

## **2. Present condition of rural villages and their development**

### **(1) Overview**

#### **1) Administrative unit and rural community**

Rural villages of Cambodia are collective habitat villages. Houses are built on plots that are slightly elevated from the surroundings to prevent them from getting flooded at the end of the rainy season, creating a scenery that appears as if the houses are floating at the center of paddy field or lined up along the natural levee. Dwelling units that were created in this manner are called “*phum*” and it is towards this *phum* that farmers generally have a sense of belonging to. *Phum* is also the subject of this study and therefore the term “village” is used synonymously with *phum* in the study.

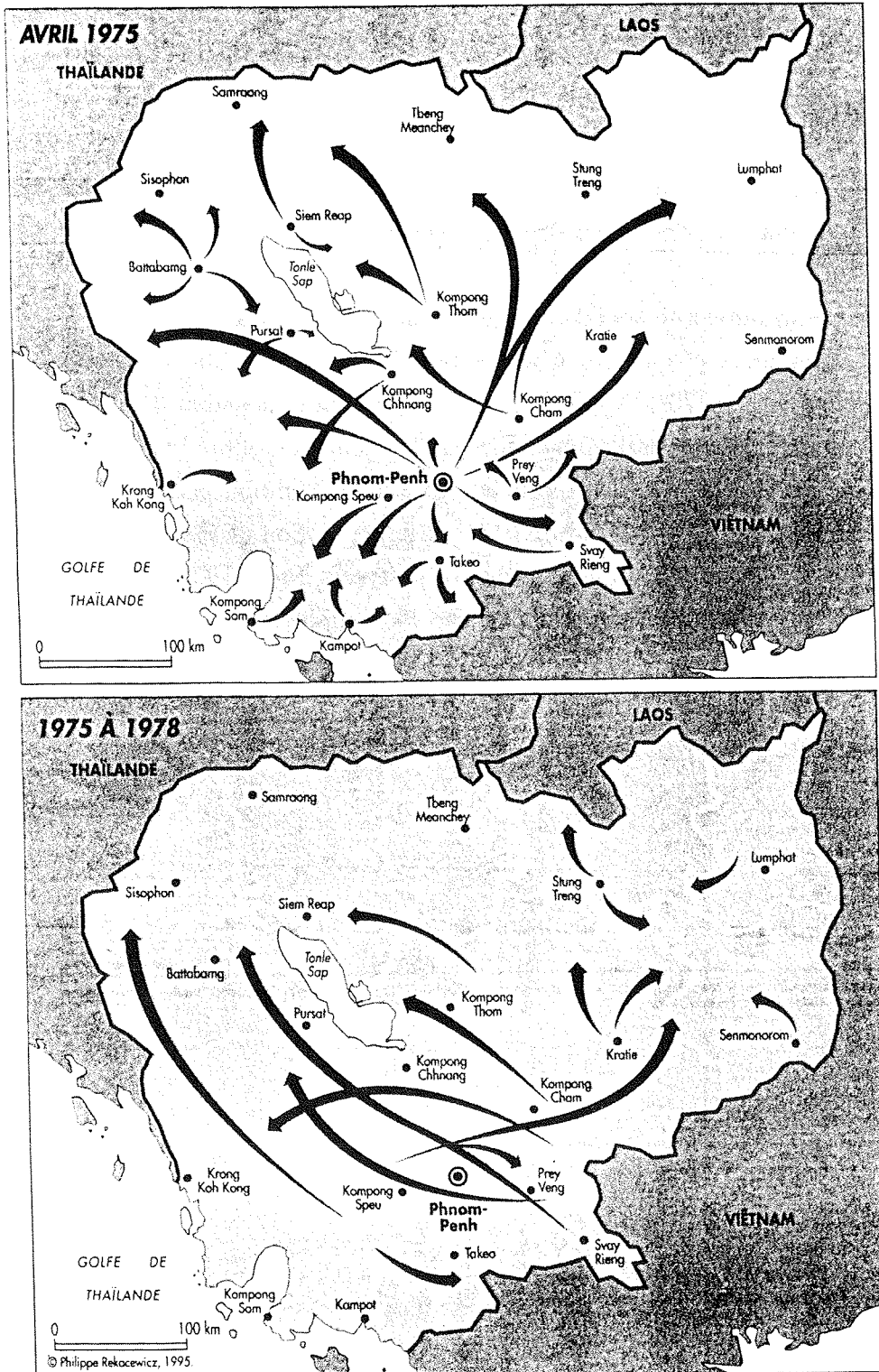
Local administrative units in Cambodia has been following almost exactly the system that was put in place during the French colonial period since the country’s independence until

present except during the Pol Pot era. The smallest administrative unit is “*khum*.” A *khum* contains ten to several dozen *phums* but does not constitute a legal administrative unit. Accordingly, if we were to use terms that are more consistent with the Japanese municipality system, *khum* would be an equivalent of a village and *phum* would correspond to a village section. However, *phum* is translated as village in this report as mentioned earlier because *phum* is apparently regarded as the most important social unit among the present day Cambodian farmers.

## **2) Political, economic and social changes of the recent years**

Rural community of Cambodia was exposed to violent political, economic and social changes throughout the '70s. Many farmers were forced to abandon their land and become refugees when the civil war broke out following the formation of the Lon Nol regime in 1970. Out of the 7 million population at the time, more than 2 million people were driven out of their land and evacuated by the end of 1971. The population of Phnom Penh swelled from 600,000 to more than 2 million due to influx of refugees. From 1973 to 1974, nearly half of the country's population was dependent on the food supply brought by air transport to the capital and local cities.

Figure 1-5 Forced migration under the Pol Pot Regime



Source : Eva Mysliwiec, «L'isolement international du Kampuchea», Oxfam, Bruxelles, 1987.

Under the Pol Pot regime that prevailed in the civil war and ruled the country for nearly 4 years thereafter, forced migration occurred ceaselessly as can be seen in Figure 1-5. All social relations that existed at the time were completely denied, and city dwellers were forced to move to rural areas. The people, including farmers that remained in rural areas, were put to forced labor after being divided into groups by sex and age. No rights were given regarding disposal of the output. In addition to production activities, they were even forced to engage in daily reproduction activities such as meals in groups.

Since hardly any study or research has been conducted about the present rural community of Cambodia, the impact of the aforementioned political, economic and social changes on the social relations of the farmers and whether the present social relations of the farmers have changed considerably from the past owing to such impact remain unknown. However, as will be mentioned in the next section, collective farming was practiced in very limited areas in the '80s in Cambodia despite the fact that the country was under a socialist regime. Therefore, it is safe to assume that the farmers rehabilitated themselves by using traditional forms of cultivation after the collapse of the Pol Pot regime and that traditional social relations also recovered in the process.

### **3) Farmland allotment through Krom Samkki**

The People's Revolution Party regime that took power after the collapse of the Pol Pot regime in January 1979 was a socialist regime that was controlled by Vietnam. The regime avoided land disputes by overlooking the ownership prior to the Pol Pot era and placed at the center of its agricultural policy the organization of farmers into groups for collective cultivation for maximum utilization of limited means of production. This system was named Krom Samkki Bongkobongkaen Phol (organization of groups for increased production) and was generally referred to as Krom Samkki.

This system had been maintained as the policy of the central government for nearly a decade until 1989 when the People's Revolution Party regime officially abandoned socialism and recovered private land ownership. However, studies that have been conducted up to now indicate that Krom Samkki had already lost its function as a system of collective cultivation at a considerably early period of the '80s on the village level. As a result, it must be concluded that collective agriculture hardly ever occurred in Cambodia under the People's Revolution Party. Nevertheless, Krom Samkki in large part defined the current land ownership structure in rural Cambodia.

The farmland ownership structure that was formed by way of Krom Samkki under the People's Revolution Party regime is in very general terms considered to have the following two characteristics. Firstly, no continuity is observed between this ownership structure and

that prior to 1975 as it started from allotment by Krom Samkki and was formed through subsequent inheritance, distribution, reclamation, and selling and buying from 1990 onward. Secondly, households with more members tended to receive larger farmland at the beginning because a policy was adopted to allot an area obtained by multiplying the number of household members by area that had been set for each person irrespective of age or sex.

Since data on the present land ownership in rural Cambodia is very limited, field study is the only way to obtain detailed data. However, one can safely assume that present land ownership in rural Cambodia has been evened out to a considerable degree after going through the Pol Pot era (as it prohibited existing ownership completely) and Krom Samkki that was implemented under the People's Revolution Party regime.

#### **4) Poverty issue (Table 1-6)**

According to an estimate by World Bank based on the data found in the Socioeconomic Study 1993-94 (A Poverty Profile of Cambodia, World Bank Discussion Paper No.373), Cambodia's poverty is concentrated in rural areas. Therefore, one can conclude that mitigation and eradication of poverty depends entirely on the advancement of rural development.

If we regard the amount of money necessary for a person to take in 2100 calories a day as the poverty line (1,518 riels in Phnom Penh, 1,264 riels in other urban areas, 1,117 riels in rural areas) and categorize those spending less than that amount as the poor class, 11.4% of Phnom Penh residents, 36.6% of residents in other cities, and 43.1% of rural residents would belong to the poor class. In the surveyed area, 39.0% of the entire population fell under this category.

However, we can turn our eyes to the percentage of the poor class in their respective categories of residence and see that the 86.5% of the poor class in the surveyed area are concentrated in rural areas. This is attributable to the fact that nearly 80% of the residents in the surveyed area lived in rural areas. Moreover, as indicated by the poverty gap index, the poor class in other cities and rural areas are far below the poverty line compared to the poor class in Phnom Penh.

Poverty is therefore an issue that concerns the living standard of the entire population in the sense that about 40% of the people are living below the poverty line in Cambodia. Furthermore, it is a top priority issue in rural development in the sense that nearly 90% of the poor class are living in rural areas.

**Table 1-6 Poverty in Cambodia (regional comparison)**

	Percentage of population	Personal index <sup>(2)</sup>		Poverty gap index <sup>(3)</sup>	
		Percentage of population below poverty line among the population residing in the region (%)	Contribution to entire poverty (%)	Index (%)	Contribution to entire poverty (%)
Phnom Penh	10.7	11.4	3.1	3.1	3.6
Other cities	11.0	36.6	10.4	9.6	11.6
Rural areas	78.2	43.1	86.5	10.0	84.9
Total <sup>(1)</sup>	100.0	39.0	100.0	9.2	100.0

(1) Refers to “entire surveyed regions” and not to “entire country.”

(2) Index measuring the emergence of poverty by the number of people whose expenditure is below the poverty line.

(3) Index measuring the seriousness of poverty by obtaining the average of the magnitude by which the people below that are below the poverty line have fallen below such line.

Source: Prepared by the author based on World Bank (1997), *A Poverty Profile of Cambodia*, p.23.

## **(2) Rural development policy**

### **1) Importance of rural development**

As mentioned earlier, the Cambodian Government is currently implementing two national projects: National Programme to Rehabilitate and Develop Cambodia, which sets long-term comprehensive goals; and the First Socioeconomic Development Plan 1996-2000, which sets more concrete mid-term goals towards the achievement of such comprehensive goals. The latter in particular has been prepared based on an understanding that poverty lies at the root of the socioeconomic issues in Cambodia and that the Government must come to grips with mitigation and eradication of poverty before tackling any other issue.

As mentioned in Paragraph 4 of the previous section, it is no exaggeration to say that whether the mitigation and eradication of poverty that were held as the national issue in the First Socioeconomic Development Plan 1996-2000 would be realized in Cambodia depends entirely on rural development. The National Program Framework for Rural Development of the Ministry of Rural Development, published by the Ministry of Rural Development in October 1997, has also been prepared on the basis of the same understanding and reiterates the importance of rural development in the national level development strategy.

### **2) Programs that have been worked out for the 1996-2000 period**

In response to the promulgation of the First Socioeconomic Development Plan 1996-2000, the Ministry of Rural Development has set forth the following 6 items as priority tasks to be undertaken by the Ministry during the period of this project.

**i) Strengthening of organization and personnel training**

The need for strengthening organization and personnel training at the Ministry of Rural Development has been pointed out. As for increasing the program implementing capacity on the local level, a rural development management structure must be created. This system requires formation of village development committees (VDCs) in each village (i.e. *phum*) in addition to committees that exist on each administrative level, and positions this as the foundation for implementing participation-oriented sustainable rural development.

**ii) Improvement of road and transport network in rural areas**

Roads in Cambodia have a total length of approximately 35,800km (4,200km of national roads, 3,600km of provincial roads and 28,000km of local and rural roads) and are in very poor condition on the whole. Of these, repair and maintenance of 28,000km of local and rural roads have been assigned to the Ministry of Rural Development, and the Ministry has declared that it would approach repair and maintenance of local and rural roads by using labor-based appropriate technology (LBAT).

**iii) Offering of clean drinking water and diffusion of hygiene facilities**

Social infrastructure in Cambodia is extremely undeveloped. The degree of this problem is particularly serious in rural areas; as of 1995, only 26% and 6% of rural population have access to clean drinking water and hygiene facilities, respectively. Under these circumstances, the Ministry of Rural Development has announced that it would strive to increase the percentage of population that can obtain clean water to 65% and raise the percentage of population with access to hygiene facilities to at least 22% by the year 2000.

**iv) Diffusion of small-scale irrigation**

The food issue in Cambodia is closely related to the large fluctuations in annual rice yield. Diffusion of irrigation is the key to stabilizing rice yield and the Ministry of Rural Development is placed in charge of diffusion of small-scale irrigation that should be operated by irrigation associations comprised of villagers. The Ministry of Rural Development has announced that it would prepare a development plan concerning repair and construction of small-scale irrigation in the near future by working with other related agencies to improve the food situation of rural households.

**v) Improving food procurement ability of farm households**

According to the First Socioeconomic Development Plan 1996-2000, the degree of dependence on rice crop becomes greater among poorer rural residents who also have less



surplus food. Efficient methods for improving the food situation of such poor households include increasing the unit yield of rice, stabilizing annual yield through water management and other means, and creating sources of cash income through diversification of crops and other means. The Ministry of Rural Development has declared that it will draw up a development plan for overall increase of household food procurement capacity along the above context by the year 2000.

**vi) Promotion of rural financing and small-scale projects**

The Ministry of Rural Development will work with related agencies and NGOs on the following 4 points to coordinate rural financing projects in Cambodia that have been conducted mainly by NGOs outside the boundary of legal framework.

- Assess the present condition of rural financing on a provincial basis
- Assess the availability and demand for rural financing among rural residents
- Create some regulatory framework with regard to interest and commissions
- Build a clear policy guideline concerning rural financing and equip it with legal framework

# **Chapter Two**

## **Outline of Rural Villages and Agriculture in Surveyed Regions and Villages**

### **1. Choice of the Study Areas**

The basic targets of agricultural sector development in the First National Social Development Plan (1996-2000) of Cambodia are to: 1) increase the production of rice and other food crops for food security; 2) expand the exports of agricultural products and processed products; and 3) improve farm income through diversification of agriculture.

Due to time constraints, it was impossible for us to conduct a field survey after taking account of all these targets. Therefore, we decided to focus on the study of the actual situation and the problems for development of rice farming which is the most important food crop for the Cambodian people and cash crop farming which is strategically very important for enhancement of farm household income.

Rice farming in Cambodia can be roughly classified from the viewpoint of arable land ecosystem into: 1) rainfed rainy season lowland rice farming; 2) irrigated recession rice farming; 3) irrigated rice farming; 4) floating rice farming; and 5) upland rice farming. The study was limited to the regions where the first three types of rice farming are practiced (which also account for large percentage in terms of production and planted area) for the same reason as the themes of the study were selected.

We selected Battambang Province for the first and third types, and Kandal Province for the second type. The reasons why Battambang Province was selected are that it was one of the most advanced rice farming areas in Cambodia before the civil war, and that only a few rice field surveys have been conducted there due to the civil war and the disorder in the Pol Pot era and therefore information is strikingly lack for the planning of agricultural development. Kandal Province was selected because it contains the cash cropping area in the vicinity of Phnom Penh where colmatage farming systems are prevailing in the Mekong and Bassack Basin.

In Battambang Province, we selected two villages, taking into consideration several factors such as distance from our accommodation, safety, availability of rural credit and irrigation in cooperation with CAREERE (to be mentioned below). On the other hand, we selected one village in the colmatage farming system area along the Bassack river basin because the village is close to Phnom Penh and the colmatage canal there is well maintained and operated.

## **2. Overview of Agriculture in Surveyed Regions**

### **(1) Agricultural geography of surveyed regions**

A striking contrast in ecological environment exists between Battambang Province and Kandal Province, the two regions that were selected for this survey. This has resulted in considerable difference in agro-ecosystem and farming methods.

Battambang Province is located in the plains below the cliffs of Dangrek Mountains that continues from the Korat Plateau and has a growth of dry dipterocarp forest on soils consisting mainly of gley clay and brown gley soil. Paddy farming in the province has been dependent on rainwater from the beginning, as it could not use the river water for irrigation by carrying it over the natural levee and over low and flat paddy field because of large fluctuations in the water level. Altitude ranges between 10 and 20 meters, making channel irrigation practically impossible.

A map of the surveyed region shows that the Sangke River that flows north towards Battambang is unstable like a channel inside a delta, meandering back and forth and leaving oxbows. Rice farming is only practiced during the rainy season before the introduction of pump irrigation, and a large gap is presumed to have existed between good and bad crop due to the influence of unstable rainfall.

Settlements are located on the natural levees. Vegetables are grown in the vicinity of settlements and consumed mostly by the growers. Flat paddies are located behind the settlements. Some of them have small-scale pump irrigation.

The area is extremely flat. Elevated parts are used for planting fruit trees such as orange and for intercropping maize and groundnuts. Red pepper, a high value cash crop, is also seen but is hardly irrigated because it is planted at some distance from the river.

Meanwhile, at the sea-level flood plain that has developed along the Bassack River at the tip of the Mekong Delta, rice farming is abandoned during the rainy season when the violent flood engulfs the area. Water rises high enough to force the Tonle Sap to flow backwards and becomes uncontrollable. It is not even possible to plant floating rice here, and recession rice farming, in which rice is planted by following the water level that resides with the beginning of the dry season, is practiced.

Silt-laden irrigation that attempts to renew the soil on back swamps by building waterways at right angles to the flooding river, i.e. the so-called colmatage farming, is also practiced here and has given rise to a reasonably advanced land use. A thick and fertile alluvial has developed in this area.

As shown in Figure 2-1, colmatage farming has a quite multiplex agro-ecosystem. Natural levee is the only area that is not submerged during the rainy season. Settlements are built in clusters there, surrounded by fruit trees such as coconut and longan. Settlements can be found at corners of a waterway (prek) that extends from the main course. There are paths along the waterway that lead to farms; after passing through the orchard, rectangular farms continue at right angle to the waterway.

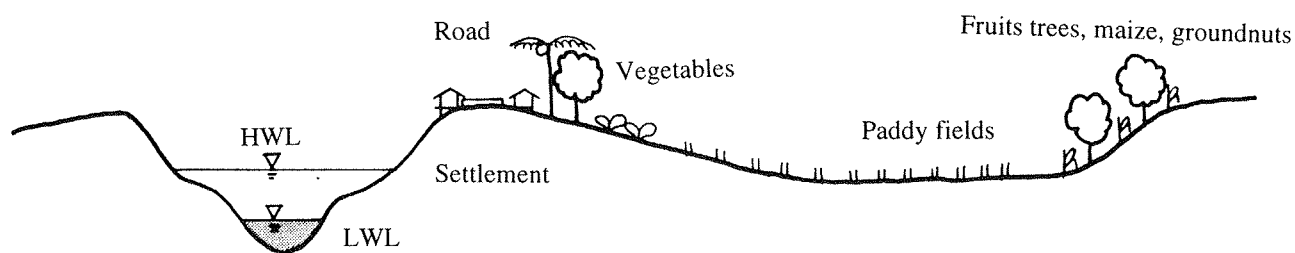
Vegetables and red pepper are mainly planted near the waterway and crops such as sugarcane are planted at some distance from the waterway. Field crops are cultivated in a rather intensive manner.

Back swamps are used as recession paddy field and as fishing ground. Takaya<sup>1</sup> argues that the boundary of cultivation range for recession rice and floating rice can be clearly distinguished, even though it “shifts back and forth to a small degree from year to year” between region to the north of Phnom Penh and region to the south of Phnom Penh. According to his theory, the banks of the Bassack River are the boundary between recession rice and floating rice in Cambodia and comprise a region where the two crops are grown in mosaic patterns.

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1 TAKAYA, Yoshikazu: 1978, Suiden no Keikangaku-teki Bunrui Shian [Tentative Landscape Classification of Paddy Field], *Noko no Gijutsu*, pp.15-42

**Figure 2-1 Conceptual diagram of agro-ecosystem in the Battambang area**



## **(2) Characteristics of agriculture in the surveyed region**

The study was mainly conducted at two villages (Village AT and Village KN) in Battambang Province in western Cambodia and at one village (Village P) in Kandal Province in the outskirts of capital city Phnom Penh. Base data for the two provinces are shown in Table 2-1. Although Cambodia is often seen as a country with low population density compared to her neighbor Vietnam, cultivated land under paddy per farm household is less than 1 hectare. Traditional farming relying on rain-fed irrigation is mainly practiced. For this reason, rice yield has not increased beyond 1.6 to 1.8 tons/hectare, which is considerably low when seen from international standards. Prevalence of rain-fed irrigation has also led to large fluctuations of yield. As will be mentioned later, individual farmers are exposed to considerable risks. Therefore, any development aid offered will have to work out a strategy for reducing risks that are incurred by farmers in addition to improving land productivity.

Forest covers 42% of the total area in Battambang Province and another 23% is used for farmland. Lake Tonle Sap occupies 21% of the province, and 10% of the land has been abandoned due to land mines. Sixty-eight percent of the population is engaged in agriculture, and rice is planted on 92% of the farmland. According to agricultural statistics, cultivated area in rainy season per rice farm household in Battambang Province is 2.08 hectares, making it—along with Banteay Mean Chey Province which used to comprise the same province and has an average cultivated area of 2.76 hectares—one of the regions with the highest cultivated area in Cambodia where the average cultivated area amounts to only 0.98 hectare (not including special regions such as Sihanuk Ville Province and Koh Kons Province). In contrast, average cultivated area in Kandal Province is at the lowest level of 0.31 hectare. As for dry season rice farming, the ratio between dry season rice farming area and rainy season rice farming area is 1.37% in Battambang Province as opposed to 10.72% in Kandal Province (national average is 13.61%). This is attributable to the extensive recession rice farming practiced in the colmatage region of Kandal Province. In contrast, irrigated dry season rice farming is practiced only in exceptional cases in Battambang Province.

**Table 2-1 Agricultural base data of the surveyed provinces**

	Battambang Province	Kandal Province
Area	12,448.9 Km <sup>2</sup>	3,463.7 Km <sup>2</sup>
Population (1996)	716,600	984,400
Population density	57.56/Km <sup>2</sup>	284.2/Km <sup>2</sup>
Number of farm households	133,197	180,455
Average number of family members	5.38	5.46
Number of farm households planting rice	93,010	138,600
Planted area in rainy season	193,065 ha	42,891 ha
Land productivity for rainy season rice	1.61 ton/ha	1.85 ton/ha
Planted area of rice per farm household	2.08 ha	0.31 ha
Planted area in dry season	2,640 ha	4,600 ha
Land productivity for dry season rice	2.55 ton/ha	3.19 ton/ha
Total rice planted area	195,705 ha	88,891 ha
Average land productivity	1.63 ton	2.58 ton
Irrigated area in rainy season	23,990 ha	11,582 ha
Irrigated area in dry season	507 ha	21,200 ha
Chemical fertilizer input in rainy season	40.6 kg/ha	36.4 kg/ha
Chemical fertilizer input in rainy season	206.5 kg/ha	103.2 kg/ha
Average chemical fertilizer input	41.9 kg/ha	69.2 kg/ha
Number of tractors	267	17
Rice planted area per pair of draft oxen	3.50 ha	2.48 ha
Number of draft animals per farm household (pairs)	0.67	0.41
Number of pigs per farm household	0.47	1.12
Number of fowls per farm household	2.91	5.45

Note: Rainy season irrigation is auxiliary irrigation and dry season irrigation includes a large percentage of recession rice farming (particularly in Kandal Province).

Source: Ministry of Agriculture, Forestry and Fisheries, *Agricultural Statistics 1997-98*.and Center for National Policy, *Provincial Profiles*, Dec. 1997.

### 3. Outline of Village and Agriculture in the Surveyed Villages

Outline of geographic location, occupation, number of consumer durables, land use and livestock breeding in the surveyed villages is shown in Table 2-2. The results of a hearing survey conducted separately on village chiefs regarding the characteristics of agriculture have been attached separately in this report.

**Table 2-2 Basic data on surveyed villages**

	Village KN	Village AT	Village P
Distance to a city	3.5 km	4 km	20 km
Number of farm households	158	250	320
Fruit farm households	NA	20	NA
Non-farm households	NA	5	NA
Total number of households	158	255	320
Number of bicycles	47	195	NA
Number of motorcycles	20	49	NA
Number of TV sets	10	12	NA
Number of irrigation pumps	15	11	NA
Paddy field	89 ha	161 ha	150 ha
Orchard and rice farm	25 ha	82 ha	104 ha
Residential land	12 ha	30 ha	40 ha
Total	126 ha	273 ha	294 ha
Cultivated land under paddy per farm household	0.56 ha	0.63 ha	0.43 ha
Cultivated area per farm household	0.71 ha	0.95 ha	0.73 ha
Number of draft oxen	271	248	NA
Number of pigs	35	90	NA
Economic condition 1) Affluent	0.63%	0.00%	NA
2) Fair	24.38%	14.12%	NA
3) Poor	45.38%	60.00%	NA

Note: Economic condition has been classified by using ownership of house, TV set and bicycles as the standard. Incidentally, the poorest households owned neither draft animals nor farmland. Data from Village Development Council (VDC) were used for Battambang Province. Figures on Kandal Province are based on materials on communes including Village P. However, there is no complete consistency with the results of hearing survey on village chiefs owing to difference in years on which the data was prepared.



## **(1) Rural community**

### **1) Population of surveyed villages**

In this study, field study was conducted at Village KN and Village AT in Battambang Province and at Village P in Kandal Province. Section of this study pertaining to population will be described here. Hearing survey was conducted by using 15 question sheets in Village KN and 12 question sheets in Village AT. According to an outline of the village from a hearing survey conducted on village chiefs to obtain general information about the village (attachment), population of Village KN and Village AT in Battambang Province was 870 and 1,417, respectively, while that of Village P in Kandal Province was 1,290.

Average number of household members ranged between 5.5 and 5.6 in Village KN and Village AT in Battambang Province while that of Village P in Kandal Province was considerably lower at 4.0.

An overview of village's population based on question sheets showed that households included in the study was larger in scale compared to village average. For instance, average number of household members in Village AT according to the hearing survey of village chief was 5.6 as opposed to 7.1 among the households included in the survey.

This appears to be the result of having conducted the hearing survey on heads of family that have a grip on their household owing to the emphasis placed on farm household economy in the study. In addition, population of those aged 10 to 20 was largest among age groups while that of those aged 0 to 10 was small in this hearing survey, although it is not possible to determine from this study whether fertility rate is declining because the subjects tended to be relatively older.

Be that as it may, the large difference in average number of household members between average village household and the relatively old-aged households included in this study signifies that average household scale differs largely between generations and that it is smaller for younger households. Whether this is because there are more children to be born in households or the result of change in people's approach towards childbirth cannot be determined without further study. However, there were cases among young households that were actively accepting contraception by visiting commune hospitals for consultation.

Moreover, the hearing survey in Battambang Province gave an impression that traditional behavior patterns were being observed more strictly compared to Kandal Province which is located in the outskirts of Phnom Penh. For instance, the custom of changing the breast-feeding period between male and female infants (generally longer for boys and shorter for girls) was observed in 4 out of 12 households in Village AT as opposed to 1 out of 25 households in Village P of Kandal Province.

We were also able to obtain a simple total of an exhaustive study conducted 2 years ago in Village AT. It showed that the damage incurred by the Cambodian disturbance still remain serious to the present day, as about 14% of the population in Village AT are refugees. Stories told by villagers during the hearing survey in Village P included death of a child and forced marriage experienced during the Pol Pot era. Judging from the fact that old customs are remaining more in Battambang Province compared to Kandal Province, one can conclude that the Pol Pot faction exerted stronger influence in urban areas and its surroundings through destruction of values and cultural customs.

**Table 2-3 Population of surveyed villages (based on question sheets)**

Village name		Village KN	Village AT	Village P
Average age of the respondents		45.2	47.7	51.2
Average age of their spouse		42.7	44.5	47.6
Average household size		6.3 persons	7.1 persons	6.0 persons
Population ratio by age	Age			
	0–9	22.1%	29.1%	14.4%
	10–19	26.3%	29.1%	40.2%
	20–29	17.9%	12.8%	12.6%
	30–39	16.8%	8.0%	7.6%
	40–49	5.3%	10.5%	10.7%
	50–59	5.3%	7.0%	6.9%
	60+	6.3%	3.5%	7.6%
Total		100.00%	100.00%	100.00%
Inheritance				
	Equal inheritance	1	9	16
	First son	5	0	1
	First daughter	1	1	0
	Last child (son)	3	0	1
	Last child (daughter)	4	0	0
	Others	1	2	7

Source: Based on hearing survey

**Table 2-4 Population composition of Village AT**

	Native residents	Refugees	Total
Number of households	218	37	265
Population	1222	191	1413
Male	580	91	671
Female	642	100	742
Male-female ratio (number of males for every 100 females)	90.3	91.0	90.4
Average household size	5.6	5.16	5.3

Source: Village AT Development Committee

## 2) Inheritance

The results of collected question sheets show that equal inheritance is practiced in the vast majority of households except in Village KN. All villages are far from having surplus arable land, and family planning is being introduced, as imperfect as it may be.

Questions regarding inheritance produced distinctive results. With the exception of Village KN, equal inheritance accounted for staggering majority. In Village P, for instance, many of the responses that were classified under “Others” came mostly from those who “had no particular idea,” and 16 out of 18 persons who had some kind of opinion about inheritance responded that they would be following the system of equal inheritance.

In contrast, out of 15 households that responded to the questions in Village KN, 5 said that their first son would inherit their assets and 3 said that their last son would inherit their assets, which means that more than half of the households have chosen their sons as their heirs. Many of those who responded that they would let their daughters inherit their assets gave the reason that their daughters would look after them in old age, while those passing down their assets to their sons did not have any clear reason for doing so.

A hearing survey of the village chief in Village KN revealed that people in this village store human feces and use it as liquid fertilizer for growing cabbage. According to the Rural Development Department and CAREERE staff that accompanied the study, this is not by any means a common custom in the region. In the Kandal Province study, there were cases where human feces accumulated in ground permeation toilets were dug up a few years later and broadcasted on the field like soil but no cases of sprinkling it in liquid form were found.

The response from village chief regarding the reason behind this practice was that it was taught by Chinese merchants. Rice brokerage in Battambang Province is said to be controlled by the team comprised of the Chinese and local power. As can be seen in

preference for male child in the inheritance system, Village KN might have been strongly influenced by the Chinese culture.

### 3) Education

A question “If you had several school age children but could send only one of them to school, which child would you send—your son or daughter?” was asked as a question concerning education. The vast majority of respondents said that they would “send their son.” The response to a question about the reason for selecting their son was that “boys are said to have “long legs” in Cambodia since the old days,” meaning that they leave their home and earn money at a distant place. On the other hand, girls are seen to stay with their parents unless there is a special reason for not doing so, and therefore do not need to go so far as to leave the village to receive education.

This question was followed by another question, “If your children can only receive education up to second grade, which child would you choose?” The response to this question turned out to be completely different from the earlier question.

If the children would stay with their parents and could only receive enough education to read and write, the vast majority of respondents replied that they would send their daughter to school because she would be more reliable in looking after her parents. Therefore, the decision by majority of households to send their son to school instead of daughter does not necessarily reflect the existence of a clear preference for boys. Rather, it may be that this society generally does not have a clear preference for boys or girls.

**Table 2-5**

Village name	Village KN	Village AT	Village P
Send boys instead of girls to school	15 persons	10 persons	24 persons
Others	0 persons	2 persons	1 persons

While definite data could not be obtained with regard to the school attendance rate, an example from an primary school in a commune in Kandal Province is as shown below.

**Table 2-6 A commune primary school in Kandal Province**

	Number of students that entered the grade	Number of students that proceeded to the next grade	Ratio of students that moved on to the next stage of education
Grade 1	617	358	54.78%
Grade 2	398	257	64.57%
Grade 3	405	298	73.58%
Grade 4	256	211	82.42%
Grade 5	216	191	88.42%
Grade 6	101	93	92.07%

Source: Commune primary school data

Although the above figures include a considerable number of children that failed to move on to the next grade, the ratio of students that moved on to the next stage was only 54.78% from first to second grade, and 64.57% from second to third grade. It signifies that a large number of children have dropped out at lower grades of primary school. If these figures are common, they indicate that only 35% of the children that enter primary school move on to the third grade after 2 years.

Similarly, these figures, if regarded as a norm, suggest that only 17.4% of the children complete primary school and move on to secondary school. It must be said that solution of the education issue is extremely important when considering the modernization and rural development of Cambodia.

## **(2) Agriculture**

### **1) Infrastructure and irrigation**

Village AT and Village KN are both located along the Sangke River, although it is not possible to build irrigation facilities for taking water directly from the river in either of the villages due to the large gap in water level between rainy season and dry season. Maps of Village AT and Village KN prepared by VDC are shown in Figure 2-2.

Figure 2-2-1) Map prepared by the Village Development Committee (VDC) of Village AT

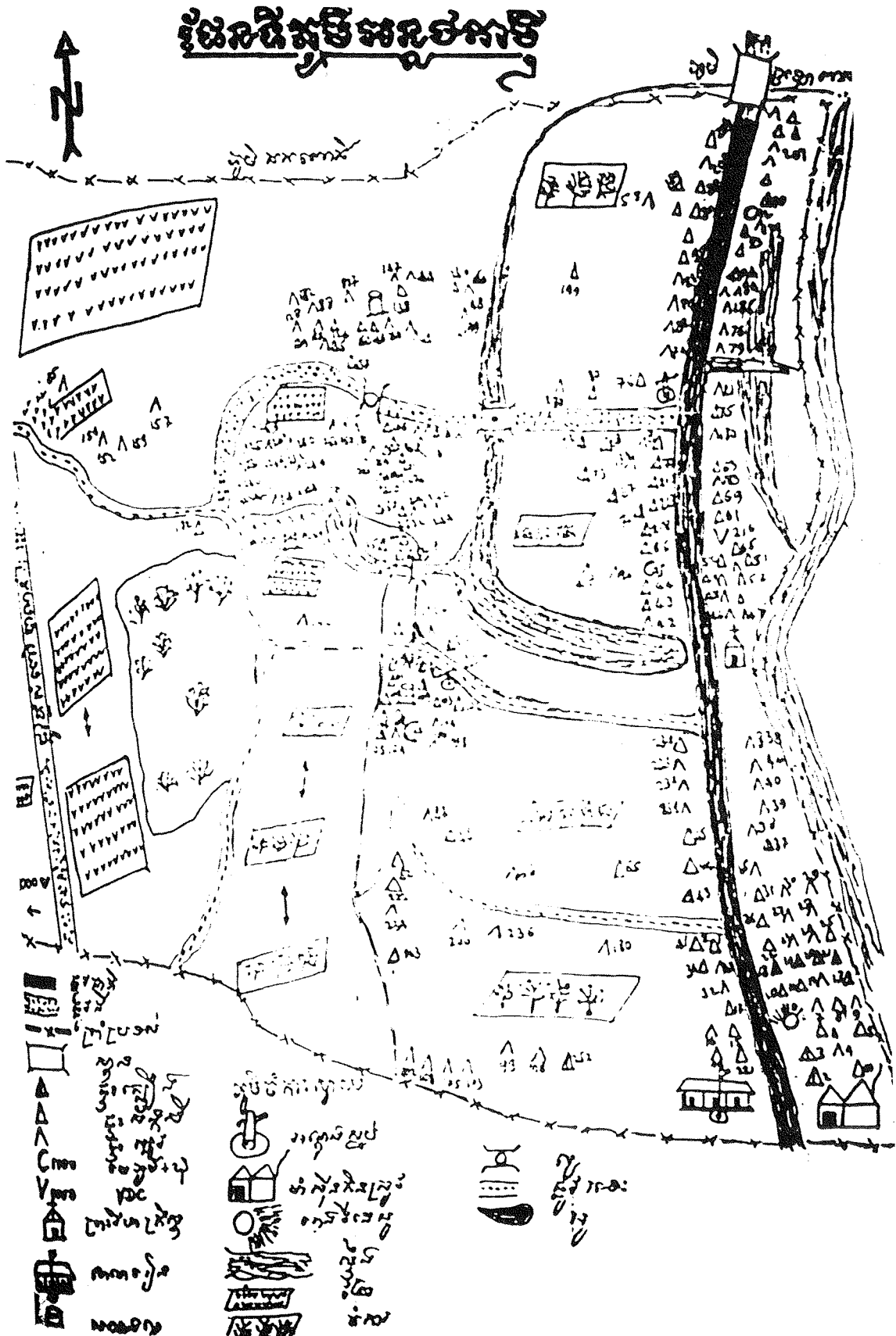


Figure 2-2-2) Map prepared by the Village Development Committee (VDC) of Village KN





At Village AT, the Sangke River flows from south to north at the right side of the map, and there is a road that runs along the river. Farm households as well as orchards are built on both sides of this road. The western side of the road gently slopes for some distance before reaching a flatland where paddy field extends. The village has been using its 11 pumps for irrigation in the recent years, although it is limited to orchards due to distance from the source. Water is supplied to limited area of paddy field (10 hectares) by taking advantage of the topography where the land becomes flat after short distance from the river bank. Pumps are owned by individuals. For instance, a farmer purchased a pump for 10,000 bahts and 100 water pipes at 115 bahts per pipe in 1997. For the reason stated above, irrigation is used primarily for the orchard. He also sells water at 3,500 riels an hour, and diesel fuel costs 1,100 riels per liter (1 hour). Paddy field is cultivated in rainy season and therefore traditional varieties are planted.

There are several individually owned water pumps in Village KN. A farmer owning 1 hectare of paddy field purchased an 8-horsepower Chinese pump for 6,000 bahts 2 years ago. He is also selling water for 3,000 riels per hour. In this village, a total of 29 farm households, owning a total of 10 hectares of paddy field, received an assistance in kind of 2 pumps (\$450 each) and 51 meters of water pipe from an NGO (under financial assistance from Oxham).

In all villages that were studied, cultivated land under paddy per farm household was very small at around 0.5 hectare, much lower than the national average for Cambodia. Few farm households had marketable surplus for rice. Rather, many farm households cannot produce rice above the amount they consume and are compelled to buy it during the preharvest months. It is the cultivation of cash crops at orchards and fields that provide the farm households with their important cash income.

Flood-accommodating agriculture is practiced in Kandal Province as it is a region prone to flood damages. A typical example of this is the type of irrigation introduced in colmatage (rice farming in recession). Village P located along the Bassack River was selected as a typical colmatage-practicing village. Since water must be supplied through intervention irrigation during the dry season in March, water channel is closed after building a dam to prevent water from flowing backward, and water is pumped into colmatage water channel (prek) by using a pump.

Stretching at the opposite bank of Village P is a flat 30,000 hectare farmland that lies between the Mekong River and the Bassack River. However, land use remains incomplete because of the flood that occurs in the rainy season. The region has a potential for increasing its grain production if flood control is implemented to enable introduction of dry season rice farming accompanied by irrigation.

A development project named CAMFED (Cambodia Foundation for Education and Development) is under way in this region. CAMFED is a Cambodian NGO that was established in 1990 and has been carrying out an agricultural development project for Kandal Province since 1993. The project is divided into Phase I and Phase II, and the former is currently under way. Phase I involves 1,000 hectares of land and 2,800 farm households. In this project, land is first surrounded by an embankment, which is also used as a road, to control water. In dry season (also during water shortage in rainy season), the floodgate is closed and water is pumped to raise the water level of irrigation channel. By raising the water level higher than the paddy field surface, water can be drawn into the paddy field by simply cutting the ridge. This irrigation channel was built during the Pol Pot era but had not been utilized partly due to poor maintenance.

The goal of this project is to realize triple cropping in this region. The total cost of \$150,000 is financed by loans from foreign NGOs. The loan is to be repaid in 5 years by charging \$15 per hectare as irrigation charge for second and third crops. Phase II will have a budget of \$1 million and will involve 2,000 hectares and 4,568 farm households. However, there are no prospects for financing at this point.

## **2) Farmwork and technology**

### **i) Rice farming**

Rice farming in Cambodia can be distinguished as follows from the viewpoint of its arable land ecosystem. In this study, broadcast intertillage rice paddy (Battambang), recession rice paddy (Kandal), rainy season irrigated rice paddy (Battambang) and upland rice (Kandal) were observed in the villages that were studied. As mentioned in the outline of the surveyed areas, Kandal is the southern limit for floating rice. Although there have been reports of floating rice being grown at back swamps in regions with colmatage agro-ecosystem, it will be omitted from this study as we were not able to confirm this in the actual hearing survey.

Moreover, rainy season irrigated rice paddies seen in Battambang Province uses pumps and is auxiliary in nature. Paddy rice is grown using transplantation at these paddies. The details will be omitted, as there is no technical feature worthy of special mention.

Information about upland rice was received from one informant in Kandal Province among all the regions covered by this study. The planted area, however, was only 10 ares. Dried rice seeds are sown after plowing the field, and a hoe-shaped apparatus is used for weeding. We were not able to confirm in this study whether it was grown by slash-and-burn or as a variation of broadcast intertillage.

### **Broadcast intertillage (rainy season)**

Rice farming of this type is performed by thickly sowing rice seeds and using ploughs and harrows to thin out after dissemination. As argued by Takaya<sup>2</sup>, it strongly suggests an element of Indian agriculture that still remains in Cambodia. By region, it is dominant in the northern parts of the country that are not flooded during the rainy season. Under this system, dried rice seeds are sown very thickly (150 to 200 kilograms per hectare<sup>3</sup>) on dry paddy from April to May. When the height reaches 10 centimeters or so, ploughs and harrows are used for weeding and thinning. Although it is said that cultivation tends to be hindered when rainfall is delayed in Battambang Province, Tanaka has reported that “two months after dissemination, (omitted) paddies are still dry<sup>4</sup>.” Some questions also remain about this matter, as its significance in terms of weeding will be diminished once the flood starts. Notwithstanding all of this, farmers practicing this technique are decreasing with the popularization of irrigated transplanted paddy field.

Tilling of the main paddy is performed prior to dissemination, using short yoke plow with long, curved shafts that are often pulled by a pair of cattle. In Battambang Province, moldboard is smaller compared to that in Kandal Province or nonexistent. Harrows have 10 to 20 centimeter-long teeth at 15 to 20 centimeter intervals, and are 1.5 to 2 meters wide on the whole.

Harvest in rainfed paddy starts around the end of October by using the so-called  $\gamma$  letter-shaped sickle named *kadiew* (*kadiew ompo* in Kandal Province) that has a long protrusion on the other side of the blade. Since the direction of rice growth is not uniform in broadcasted sowing paddy, the back portion is used to scoop up the lodged stalk. *Kadiew* is mainly seen in Battambang Province, and a crescent-shaped sickle with less curve named *kadiew kwaang* is more popular in Kandal Province.

Cattle hoof threshing, suggesting an extremely strong Indian influence, is seen in Battambang Province. This is performed by spreading the harvested rice on rice paddy that has been covered with cattle dung or mud, and having the cattle walk over it.

Granary is rarely seen in Kandal Province but is common in Battambang Province. As in the case of northeast Thailand, this is believed to suggest a large gap between good and bad crop in the region.

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2 TAKAYA, Yoshikazu: 1985, *Tonan Ajia no Shizen to Tochi Riyo*, [Nature and Land Use in Southeast Asia], Keiso Shobo, pp.221-216

3 Values were less than half in a socioeconomic hearing survey.

4 TANAKA, Koji: 1987, *Inasaku Gijutsu no Ruikei to Bunpu* [Types and Distribution of Rice Culture Technology], Tadayo WATABE ed., *Ine no Ajia-shi*, Shogakukan, p.253

### **Recession paddy (dry season)**

As pointed out in the outline of the surveyed regions, recession rice farming is a method of rice farming that is adapted to the hydrological environment at the tip of delta region. Rice cropped in the dry season by following the residing water is called *boro* in India and Bangladesh, and also practiced in the ecosystem at the tip of delta.

In this area, tilling is performed by using ploughs before the flood at the beginning of the rainy season in June and July. It is recognized that the purpose of this practice lies in effectively obtaining the sediments from the flood. The reason for moldboard being larger in Kandal Province may be related to the physicality of soil.

The seedbed is prepared in December by watching the water level. An area near the main paddy is leveled by a rake to create the nursery when the water level is sufficiently low. An area near the residence is used for preparing the nursery when the water level is high. The water will be brought from the river in such case.

Rice seeds are soaked in water for 2 nights, and then put inside a haversack and buried in the ground for about 3 days to hasten germination before they are broadcasted on the field. The amount of seeds disseminated range from 50 to 80 kilograms per hectare of paddy field. Transplantation to the paddy field starts as early as 30 days after the germination. Its timing, however, is determined more by the water level than by the age of seedling.

As the paddy field is plowed before the rainy season flooding starts, newly accumulated soil is soft and therefore is not tilled prior to transplantation. Normally, planation using a rake is the only work performed prior to transplantation. Although scarification is performed in some cases, it is done more for the purpose of planation than tilling. Fertilization is sometimes performed at this point.

Transplantation is performed successively from the lower part of the paddy which is closer to the water level to the upper part. It is presumed that rice-planting work used to be a labor exchange undertaking, but is often performed by hired labor today. In many cases, the owner of the paddy field is engaged in planation work. Seedlings are planted in random manner at intervals ranging from 15 to 30 centimeters. Use of plant stick was not confirmed at the surveyed village in Kandal Province. Depending on the area of main paddy, rice planting continues on and off for a period of about one month.

Weeding is performed roughly twice during the growth stage. The first weeding takes place within a month or a month and a half from the transplantation, and is mainly performed by hand. The second weeding is performed prior to boot stage, using *kadiew kwaang*, a crescent-shaped sickle with less curve.

Harvesting starts in early April. Two to three varieties were harvested successively at the surveyed village in Kandal Province, with hardly any difference being observed between

early-maturing and late-maturing varieties. Reaping is performed by cutting the stub with *kadiew kwaang*. It is performed in the same manner as transplanting in the sense that hired labor is used. Harvested rice is spread out on the paddy surface for two to three days to dry out in the sun and are piled up after being put into bundles of about 15 centimeters in diameter.

When the month-long reaping is completed, threshing is performed at the threshing ground which is prepared by daubing the ground with mud, putting the bundle between *k'niap* (a thresher with two sticks that are connected with a string) and hitting it against a threshing board named *kadaa bao*. It takes about a week to remove the hulls with a sieve of about 40 centimeters in diameter, winnowing out the rice, putting rice in a haversack and carrying the rice to the premises by oxcart, also partially using hired labor in the process. Rice is stored in a partitioned section of the house or under the floor. Granary is usually not seen in the premises in Kandal Province.

## **ii) Field crops and fruits**

### **a. Kandal Province**

As already explained in the outline of the surveyed areas, an extremely diverse space utilization exists in the colmatage agro-ecosystem of Kandal Province. As a result, field crops such as sugarcane, maize, red pepper and vegetables are serving as the major source of cash income as commodity crops.

Vegetables are grown during the period of sufficient irrigated water in August and September. Planted areas are mostly located near waterways, presumably for the convenience of drawing in irrigated water that comes in three times a day. Farming itself is performed in a very intensive manner by creating 20 centimeter ridges and spreading straws for mulching. Considerable amount of 16-20-0 chemical fertilizer is applied in addition to urea.

Sugarcane is planted at relatively high sections of the natural levee. Repeated cultivation is possible but harvesting must be completed within 8 months after planting because flood occurs every year at the end of rainy season. Crop rotation is practiced with vegetables or green grain after being planted for 2 years. Crop rotation with maize is also seen occasionally.

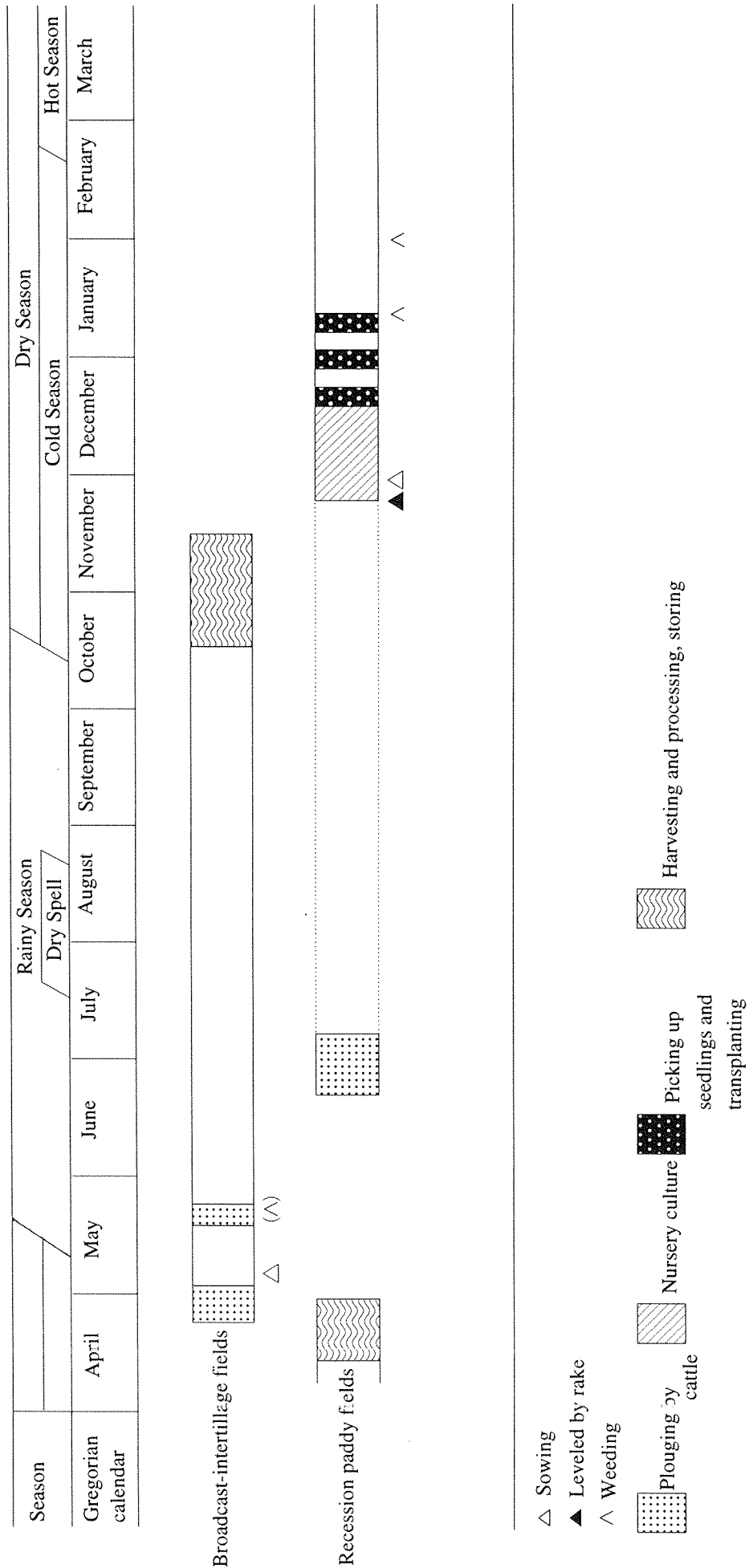
Red pepper is one of the most important commercial crops as it can be harvested 3 months after planting for more than 2 months at intervals of one week in addition to having high commodity value and being suited for long-term storage after drying. Similarly, planting of garlic is also popular.

b. Battambang Province

Contrary to our initial notion of Battambang being a region specializing in rice farming, many fruit trees and horticulture crops were observed in the study. Common crops were groundnut and sweet potato. As in Kandal Province, red pepper was widely planted as an efficient commodity crop.

The practice that caught our attention was the intercropping and mixed-intercropping using fruit tree such as orange and crop such as maize. It was often found in high areas that are not suited for paddy field. Cashew nut is also a tree crop used in this kind of intercropping and mixed-intercropping, although it was very limited in quantity.

**Figure 2-3 Rice Cropping Calendar in the Surveyed Region**



### 3) Livestock

Tilling work is basically performed by a pair of cattle. In Cambodia, there are 1,293,699 draft cattle and 428,324 draft cattle for tillage (percentage is low but includes water buffaloes). Since there are 1,870,113 rice farm households, a farm household would own an average of 0.46 pairs of draft cattle. The same ratio is 0.67 in Battambang Province and 0.41 in Kandal Province. Although this indicates that the majority of farm households do not own 2 cattles, it does not necessarily mean that there is shortage of draft cattle. Generally speaking, a pair of cattle can cultivate about 3 hectares of paddy field. Cultivated land under paddy per pair of cattle is 3.50 hectares in Battambang Province and 2.48 hectares in Kandal Province. This means that the number of plowing cattle is proper when seen in proportion to area of paddy field. For this reason, a leasing market for draft cattle exists in many parts of these provinces.

Among the sample households, 11 out of 28 farm households (39.3%) in Battambang Province and 12 out of 25 farm households (48%) in Kandal Province owned a pair or more of draft cattle. In addition, 4 farm households and 1 farm household owned 1 cattle, respectively. Farm households owning only 1 cattle plow their land through an exchange with similar farm households while those that do not own any cattle rent one at 8,000 riels per day.

On the other hand, pigs and fowl play an important role not only as usual source of cash income but as insurance in emergency situations. Under the present situation where financial system is undeveloped and inflation rate is high, livestock is also an asset that serves as a hedge against inflation. Among the surveyed farm households, only 17.6% raised pigs in Battambang Province but the same percentage was as high as 72.0% in Kandal Province. The percentage of fowl breeding was also much higher in Kandal Province at 76.9% compared to 39.3% in Battambang Province. At the time of the study, the number of farm households that had income from selling livestock in the last 12 months was only 8 households (28.57%) in Battambang Province as opposed to 17 households (68.0%) in Kandal Province. The difference can be explained by the proximity of the latter to the large market of Phnom Penh. Nevertheless, no production system to aim for export through large-scale breeding was observed in either province. Cambodian farmers are exposed to many risks related to changes in natural conditions. Draft animals are presumed to contribute to downsizing of these risks as assets that can be easily mobilized.

The study conducted in the two villages of Kandal Province <sup>5</sup> has revealed a high livestock death rate of 14.8% for calves (0 to 3 months) and 35 to 40% for pigs. This is the

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5 Farming in River Bank Areas(I) General Introduction Survey on Family Farming Breeding, 1992.



result of animals seldom being vaccinated. Dissemination of vaccination is therefore an important task of the future.

**Table 2-7 Percentage of livestock breeding among surveyed farm households (%)**

	Battambang Province	Kandal Province
Plowing cattle	39.3%	48.0%
Pigs	17.6%	72.0%
Fowl	39.3%	76.9%

Source: Hearing survey

#### **4) Rural financing in surveyed villages**

Institutional and non-institutional credit systems play an important role in the rural economy of Cambodia. Let us begin by introducing the results of Socio-Economic Surveys of Cambodia 1996 Vol. II that has conducted a comprehensive study of rural financing in Cambodia. This study, however, contains data on Battambang Province but not on Kandal Province.

About 40% of farm households have taken out a loan in the last 2 years (Table 2-8). Loans can be divided into those used for production (e.g. commerce and agricultural production) and those used for unexpected expenses (e.g. sickness and death in the family). Loans are mainly taken from relatives, friends and neighbors to signify the existence of a system possessing mutual aid properties, although moneylenders accounted for 22% of the lenders and played a measurable role in Battambang Province. Loans from commercial banks are more of an exception as institutional credit system is hardly functioning in rural regions. In Cambodia, however, micro-credit institutions are operated mainly by NGOs. Since these institutions are actively offered in Battambang Province, NGOs account for 18% of the lenders.

A look at the main reasons for taking out a loan by lender (component ratios of 10% or more) shows that the majority of loans from NGOs are used for production purposes in agriculture and commerce (Table 2-6). In addition, it must be noted that loans for treatment of illness are taken from moneylenders and merchants not to mention relatives, friends and acquaintances. One of the purposes for introduction of micro-credit system by NGOs lies in freeing the farmers from their dependence on high-interest loans from moneylenders and merchants.

However, NGOs do not play the role of contingency insurance that moneylenders and merchants offer. This is the reason behind continuation of non-institutional credit system

despite the existence of institutional counterpart and indicates one of the limits of NGO-oriented rural financing.

Short-term loans of 1 year or less account for the majority (Table 2-7) to suggest that there is a shortage of short-term working capital for production purposes.

**Table 2-8 Reasons for taking loans (%)**

	Cambodia average	Battambang Province
Percentage of families that have taken a loan	41.4%	37.1%
Component ratio of reasons for taking a loan		
Agricultural production	19.5 (273,668 R)	28.1 (256,143 R)
Commerce	31.0 (691,107 R)	31.1 (721,524 R)
Death in the family	2.6 (245,364 R)	1.4 (175,653 R)
Sickness in the family	23.6 (273,563 R)	21.2 (235,081 R)
Other contingencies	7.8 (450,722 R)	6.1 (759,049 R)
Transportation expenses	1.1 (43,912 R)	0.3 (300,000 R)
Others	14.3 (674,868 R)	11.9 (168,492 R)
Total	100.0 (505,633 R)	100.0 (426,739 R)

Note: Covers loans taken in the past 2 years.

Source: Ministry of Planning, *Socio-Economic Survey of Cambodia 1996*, Vol. II. June, 1997.

**Table 2-9 Component ratio of sources of loans (%)**

	Cambodia average	Battambang Province
Moneylenders	15.3	21.8
Merchants	6.9	6.5
Relatives	51.5	37.4
Friends/neighbors	14.9	12.3
NGOs	7.7	18.3
UN organizations	1.8	1.0
Others	1.9	2.7
Total	100.0	100.0

Source: Same as Table 2-8

**Table 2-10 Purposes of loan by lender**

Cambodia average					Battambang Province				
Money-lenders	Merchants	Relatives	Friends/neighbors	NGOs	Money-lenders	Merchants	Relatives	Friends/neighbors	NGOs
Com-merce 37.6	Com-merce 34.8	Com-merce 26.5	Illness 31.9	Com-merce 52.2	Agri-culture 32.9	Com-merce 40.3	Agri-culture 29.7	Illness 24.4	Agri-culture 46.5
Illness 22.9	Agri-culture 21.8	Illness 25.7	Com-merce 24.0	Agri-culture 34.9	Com-merce 26.5	Illness 33.7	Com-merce 27.1	Com-merce 22.3	Com-merce 38.7
Agri-culture 18.7	Illness 21.0	Agri-culture 16.4	Agri-culture 18.0		Illness 23.7	Agri-culture 20.5	Illness 19.4	Agri-culture 21.6	

Source: Same as Table 2-8

**Table 2-11 Loan period (%)**

	Cambodia average				Battambang Province			
	Less than 6 months	6 to 12 months	Over a year	Total	Less than 6 months	6 to 12 months	Over a year	Total
Agricultural production	36.6	46.5	16.8	100.0	33.4	54.9	11.7	100.0
Commerce	48.9	36.3	14.8	100.0	45.1	42.1	12.8	100.0
Death in a family	46.4	32.8	20.8	100.0	0.0	67.2	32.8	100.0
Sickness in a family	47.3	30.9	21.7	100.0	34.1	46.6	19.3	100.0
Other contingencies	55.8	29.5	14.7	100.0	36.5	42.6	20.9	100.0
Transportation expenses	83.3	6.5	10.1	100.0	100.0	0.0	0.0	100.0
Others	43.9	34.9	21.1	100.0	50.7	25.1	24.1	100.0

Source: Same as Table 2-8

There are 36 NGOs operating in Battambang Province. Half of them are offering micro-credit system, although their activities are small in scale and can only cover a few villages with the exception of ACLEDA. While we were not able to study their credit

requirements, formation of an all-round financial market will be facing a problem if the differences in conditions are as significant as indicated in the examples that follow.

ACLEDA and a NGO receiving financial assistance from Oxham (Chivit Thmey) is offering loans in Village AT and Village KN, respectively. Two NGOs including ACLEDA are also operating in Village P but have offered loans to only few farmers so far as their operations started only recently.

Let us begin by explaining about ACLEDA. In Village AT, the person in charge of VDC is keeping the record of loans offered by ALCEDA, which shows that 62 persons from 9 groups have taken loans from this organization. ACLEDA usually follows the Gramin Bank method in which 5 borrowers form a group to take out a collective loan. In the cases found in this village, however, groups consisted of 5 to 10 members. Average amount of loan was 330,000 riels (standard deviation 141,770), ranging from maximum of 800,000 riels to minimum of 100,000 riels. As shown in Table 2-12, purposes of loans include purchase of seeds and chemical fertilizers as well as purchase of livestock, although there were several cases that used a part of the loan to purchase food. Basically, there is apparent shortage of working capital. In Village P where ACLEDA just started its activities and VDC it yet to be formed, ACLEDA staff were visiting the village to set up a loan operation.

**Table 2-12 Draft animals and loans taken by surveyed farm households (purpose of loan)**

Number	Farmland (ha)		Draft cattle	Other cattle	Pigs	Fowl	Livestock sales in the past year	Loan record 1 All interest rates and loan periods in monthly basis				Loan record 2			
	Paddy	Field						Loan offered by	Amount of loan (thousand riels)	Interest rate	Loan period	Loan offered by	Amount of loan (thousand riels)	Interest rate	Loan period
Battambang Province															
Village AT															
1	2	1.5	2	0	0	0		ACLEDA	250	10	8	ACLEDA	600	10	8
Borrowed as loan for rice cropping but was used to buy rice. Second loan was borrowed to grow beans but part of the loan was used to treat a child's illness and buy food.															
2	1.3	0.3	2	0	0	0		ACLEDA	600	10	7				
Bought seeds for beans, maize and red pepper.															
3	0.5	0.2	0	0	0	0									
Rented cattle for cultivation at 8,000 riels/day.															
4	1	0	0	0	1	0		ACLEDA	200	10	6				
Borrowed for food production.															
5	0.5	0.2	0	0	0	0		ACLEDA	400	10	10				
Husband is a pig merchant and the loan was taken as working capital for his business.															
6	1.5	1	0	0	0	10	60,000	ACLEDA	500	10	8	Merchant	5,000B	10	None
Loan from ACLEDA was taken to buy chemical fertilizer. Loan from merchant was taken as an advance for working 6 months in Thailand.															
7	1	0.3	0	0	10	10	20,000	ACLEDA	600	10	10				
Borrowed to buy fed for pigs.															
8	0.3	0.3	1	2	0	0		ACLEDA	300	10	8				
Loan was taken to buy feed for pigs but was also spent to buy food for the family.															
9	1	0.6	2	0	0	0		ACLEDA	250	10	10				
Borrowed for agricultural production but was spent to buy food in reality. Repaid by selling vegetables.															
10	0.3	0.2	0	0	0	0		Relative	Rice	*	*				
Borrowed 13kg of rice from a relative at an interest of 1,500 riels a month.															
11	0.8	0.3	0	0	1	3	60,000	ACLEDA	400	10	6				
Bought food (rice) for 10,000 riels. Bought fruits for 30,000 riels and sold them at Battambang City.															
12	0.5	1.5	0	0	2	0	4000B	ACLEDA	500	10	7				
Borrowed for buying pigs and chemical fertilizers. Borrowed 3 times up to now.															
13	0.5	0.2	2	0	0	5									

Village KN												
14	1	0.3	2	0	0	0	5	90,000				
15	0.6	0.2	0	0	0	2						
16	0.5	0.3	2	0	0	0			Neighbor	Rice		
Borrowed 200kg of rice from a neighbor at an interest rate of 100%.												
17	2.4	0.2	0	0	0	0						
18	0.5	0.3	2	1	2	3	15,000		Neighbor	Rice		
Borrowed 240kg of rice from a neighbor at an interest rate of 100%.												
19	0.3	0.2	0	0	0	0						
20	1	1	2	5	0	0						
21	1	2	1	0	0	0						
22	1	0.3	2	0	0	0			NGO	4064B	4	4
Borrowed to buy chemical fertilizers and diesel for irrigation.												
23	1	0.5	4	0	0	2						
24	0.6	0.3	1	0	0	0			Rice merchant	1,000B	25	None
Borrowed to buy food (rice). Borrowed rice from a neighbor and will have to be repaid in twice the borrowed quantity.												
25	1	0.5	5	0	0	20	350,000		Neighbor	400kg	2	Neighbor
Interest on rice is 50%. 1,000 bahts were borrowed to buy diesel.												
26	1	0.5	1	2	0	0						
27	0.3	0.3	0	0	0	5	50,000		Relative	1,000B	None	None
No interest charged on the loan because it is for school expenses.												
28	0.3	0.2	0	1	0	2						
Loan was taken for rice cropping.												

Kandal Province											
1	0.3	0	0	0	5		Neighbor	100	20	1	
To buy chemical fertilizers and diesel. Owns an irrigation pump.											
2	0.4	0.2	0	3	2	8	270,000				
3	0.2	0	0	0	2	3	110,000	NGO	200	10	6
Started raising and selling golden snail with fund from NGO.											
4	0.2	0.3	0	0	0	8	650,000	NGO	100	10	6
Took loan from NGO for vegetable cultivation but borrowed more money from a neighbor because they could not pay the monthly repayment.											
5	0.4	0.2	0	0	0	0		NGO	100	10	6
Took the loan for rice cropping.											
6	1.4	0.2	2	0	2	0		Neighbor	60		
Repay 12kg of rice at the time of harvest.											
7	1	0.5	0	1	1	20	110,000	Neighbor	500	20	4
Borrowed money for tractor rent after selling the draft cattle for 220,000 riels due to illness.											
8	1	1	2	0	1	3	60,000	Daughter	360	0	24
Borrowed money to buy oxcart.											
9	0.7	0.3	2	4	3	1.5	40,000				
10	0.3	0.5	1	1	1	4		Relative	50	0	5
Borrowed money to pay farm laborers.											
11	0.8	2	2	1	1	3	5,000	Neighbor	200	20	1
Borrowed money to rent a tractor and buy chemical fertilizers.											
12	0.3	2	2	0	0						
13	1	0.7	2	1	0	3		Neighbor	50	20	1
Borrowed money to buy chemical fertilizers. Does not usually take out a loan because there is income from field crops but had to do so due to bad crop.											
14	0.4	2	2	0	20	4	550,000	Bank	500	**	12
Borrowed money from the bank at 60% interest to buy an irrigation pump. Borrowed money from a relative to plant sugarcane.											
15	3.5	1	2	2	5	20	640,000	Money-lender	1,000	20	1
Took loan from a moneylender in the market to buy chemical fertilizer and draft cattle. Loans in dollars will have to be repaid in dollars.											
16	0.5	0.1	0	0	2	20	300,000	ACLEDA	250	10	6
Borrowed money to buy an irrigation pump.											
17	0.3	0.3	0	0	1	0		Son	920	0	12
Borrowed money to buy an irrigation pump.											
18	0.5	1.5	0	1	1	23	520,000	NGO	500	10	12
Borrowed money to buy an irrigation pump.											
19	0.8	0.2	0	0	2	154	950,000	Younger sister	120	None	None
Often borrows money from sister for production purposes.											

20	0.8	0.5	2	0	0	0	0	0	1.2 million	Elder brother	300	None	6			
Borrowed money to buy draft cattle.																
21	0.4	0.1	0	0	1	18	230,000	Elder brother	250	None	1					
Borrowed money to buy medicine for illness.																
22	0	0.3	2	0	0	0										
23	0.7	0.1	0	2	2	10	480,000	Elder brother	300	None	5	Elder brother	150	None	4	
Borrowed money to buy draft cattle but it died.																
24	0.5	0.4	2	1	1	10	1.92 million	Neighbor	50	25	3					
Sold the cattle to build a house. Loan was taken for buying chemical fertilizers.																
25	1	0.5	2	1	2	6	2.15 million	Younger sister	120	None	1					
Sold the draft cattle buy young cattle. Loan was taken for buying chemical fertilizers.																

Source: Questionnaire



**Table 2-13 Loan document used by ACLEDA (Village P)**

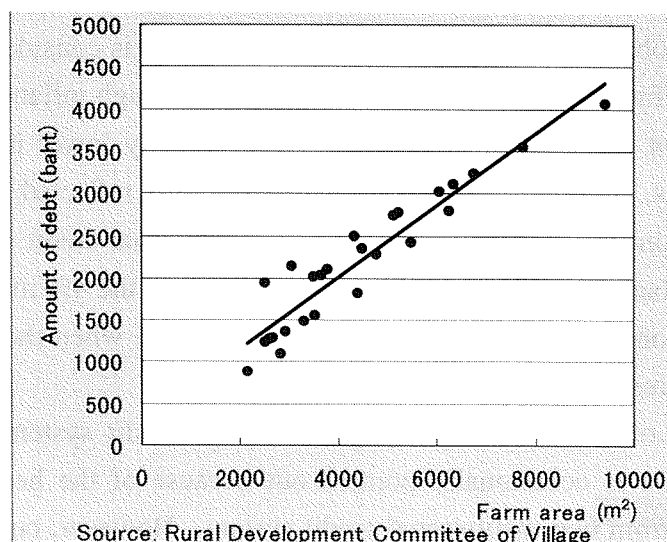
Period of loan	24 weeks	
Principal	250,000 riels	
Interest rate	70,000 riels (5% a month)	
Date on which loan was offered	5/06/98	
Repayment date	Amount of principal and interest payment	Balance after repayment
19/06/98	26,300	293,700
3/07/98	26,700	267,000
17/07/98	26,700	240,300
31/07/98	26,700	213,600
14/08/98	26,700	186,900
28/08/98	26,700	160,200
11/09/98	26,700	133,500
25/09/98	26,700	106,800
09/10/98	26,700	80,100
23/10/98	26,700	53,400
06/11/98	26,700	26,700
20/11/98	26,700	0
Assets		
Farmland	10 x 100 m	
House and land	4 x 5 m	
Field	14 x 100 m	
Cow	1 head	

ACLEDA offers unsecured loans to groups in the same manner as Gramin Bank as a rule but has started to offer secured loans. Table 2-13 is a loan document of a farmer who took out a loan from ACLEDA in Village P. At the beginning of this document, it is stated that "In the event one of the group members fails to repay the loan, other members of the group shall make the repayment in his or her place. Otherwise, assets shall be impounded." The statement is followed by the status of the borrower's asset. Interest rate is set at 5% a month against the principal, and the period of loan is 24 weeks. Since principal is repaid in installments along with the interest, interest rate amounts to 10% per month. Non-institutional credit system charges an interest rate of 20 to 25%, although principal is repaid in lump sum at the end in addition to regular interest payment (normally every month).

Therefore, the amount of interest charged by ACLEDA is about half of that charged by non-institutional credit system.

As mentioned earlier, 29 farm households took out a loan from an NGO to purchase irrigation pumps in Village KN. Repayment of the loan is made in the following manner. Each farmer delivers 20 kilogram of rice for every 0.25 hectare of cultivated area in dry season to the Village Development Council, which in turn sells it in the market. Repayment is made to NGO until that amount reaches \$1,000. It is a system that does not set any fixed period and amount of repayment in order to free the farmers from risks that originate from fluctuations in farm produce harvest and grain prices. Decisions regarding pump maintenance and water supply plan are made by the Village Development Council. Each farm household is also receiving loans from NGO at the interest rate of 4% per month to pay for irrigation water (mostly diesel cost) and chemical fertilizers. A strong correlation exists in the relationship between management area and the amount of loan to suggest that loans are being used for production.

**Figure 2-3 Planted Area and Amount of Debt (in the case of Chivit Thmey)**



Under this system, farmers jointly purchase pumps through rural financing and beneficiary farmers form an irrigation association for distributing water to their fields and undertaking pump maintenance. Operating cost such as irrigation expenses are paid by micro-credit offered to each farm household by NGOs. This system can be seen as a noteworthy case of participation-oriented rural development in which Village Development Council is functioning. Since farmer organizations are still undeveloped in Cambodia, Village Development Councils are currently being formed under the initiative of UNDP.

These farmer organizations will be playing an important role in carrying out a wide range of development strategies.

Incidentally, the loan from NGO (Chivit Thmey) is offered at an interest rate of 4% per month (simple interest). In this case, only the interest is paid every month and the principal is repaid at the completion of the loan period. This 4% interest may appear significantly low compared to 10% interest offered by ACLEDA. However, a comparison of interest rates requires caution because loans from Chivit Thmey are settled in bahts, which means that interest rate fluctuates considerably depending on the exchange rate. Since riel has been weak not only against the dollar but also against baht for some time, the borrower will have to pay for the foreign exchange loss.

The following case collected in the hearing survey was suggestive of this situation. A Battambang farmer who borrowed 5,000 bahts from a merchant (No. 6 in Table 2-12) pays an interest of 10% per month. Interest rate on loans from a non-institutional credit system in this area ranges between 20 and 25% per month. In the case of a farmer who borrowed 1 million riels and \$800 from the same moneylender (No. 15 in Table 2-13), interest rates are 20% and 6% per month, respectively. While the interest rate for settlement in riel is same as in other cases, the interest rate for settlement in baht and dollar is one-half and one-third of that in riel. This is probably attributable to the fact that dollar is considered as safe asset by the virtue of its hedge function under the present condition of high inflation and lack of riel's credibility. Interest on loans taken in baht that ranks slightly lower in credit is 10% per month. In other words, credibility of baht compared to riel is reflected in its 2 to 2.5 times lower interest rate. Conversely, high interest in non-institutional credit system is one of the major reasons behind lack of riel's credibility. In this context, the 4% interest on loans from Chivit Thmey corresponds to interest rate between 8 and 10% when they are settled in riel and will offset the interest difference with ACLEDA.

The importance of disseminating rural institutional credit system as represented by loans offered by NGOs is occasionally pointed out because of the heavy burden of high interest rate on loans from non-institutional credit system. However, consideration must be given to the fact that stable macro-economy will also contribute to lowering the interest rate of non-institutional credit system.

This issue also concerns the economic validity of institutional credit system. ACLEDA is acquiring funds from foreign aid organizations in hard currency settlement. Even if the interest rate is low, fluctuations in foreign exchange that leads to weaker riel will push up the real interest rate of loans offered in foreign currency as long as the loans to farmers are offered in riel. As a result, ACLEDA was compelled to set its high interest rate of 10% per month (i.e. 120% per year) because of the need to maintain economic validity of the financial

system. In fact, ACLEDA's interest rate was about half of the present rate until 1995 when riel remained relatively stable.

Such high level of interest may give rise to adverse selection of borrowers. Actually, ACLEDA started to limit its loans to relatively wealthy farmers that are considered to reliable in terms of repayment. It has also changed its principle of offering only unsecured loans and started asking for collateral. Although more detailed study is needed to draw any conclusion, the possibility of ACLEDA being clouded out by the activities of NGO cannot be negated. Moreover, interest rate on deposits cannot be raised even under the present circumstances where the lending interest rate had to be raised, making it difficult to mobilize savings as a result. ACLEDA used to accept savings in the past but has discontinued this practice. Under these circumstances, it would be difficult to secure ACLEDA's financial validity. Although conversion of ACLEDA into a bank is currently being considered, many problems currently exist in this regard. While two-step loans to such rural financing are eligible for development aid, foregoing issues must be taken into consideration when being applied to Cambodia. In addition, the Credit Committee for Rural Development (CCRD) was established in Cambodia in 1995 to control the large number of small-scale credit systems operating in the country. Smooth functioning of this Committee is also positioned as an important subject of foreign aid.

Commercial banks in Cambodia offer almost no rural financing. As identified by this study, however, farmers require short-term working capital. Accordingly, establishment of institutional credit system is an important task in development. In this sense, Japan's official development assistance has a large role to play in establishing rural credit system in Cambodia with ACLEDA playing the central role. However, many questions remain on the subject of whether ACLEDA, which is attempting to develop rural institutional credit system on a national scale, will turn into a banking institution in the future. ACLEDA cannot escape the reason that exists behind the failure of many Gramin Bank replicas that were operating in developing countries. Personnel training will be required to realize sufficient organizational administration. Moreover, economic viability of rural institutional credit system cannot be attained without a loan repayment plan that takes riel fluctuation risk into consideration is proposed.

## 4. Agriculture and Economy of Sample Households

### (1) An overview of households economy (Table 2-14)

Surveyed villages in Kandal Province heavily depend on agriculture such as upland crop, fruits, vegetables, rice and livestock that utilizes the so-called colmatage channels for their livelihood. Out of 344 hectares of arable land, 150 hectares are used for dry season rice farming, 104 hectares are used for growing vegetables and other field crops and the remaining 90 hectares are rainy season paddy field whose ownership has been sold to a resident of another village. Rice farming suffered enormous damage from the drought that occurred during the dry season in 1998. Sixty percent of surveyed farm households appeared to have incurred devastating damage.

In Village AT of Battambang Province, agriculture is almost 100% dependent on rainwater as irrigation is not possible in rainy season or in dry season. The villagers rely mainly on rainy season rice farming on rainfed paddy field. Of 243 hectares of cultivated land in this village, 161 hectares are paddy field and 82 hectares are fields used for growing fruits, upland crop and vegetables. During the period intended for this survey from August 1997 to August 1998, people were far more dependent on non-agricultural income than on agricultural income, partly due to the damage from the drought on farming (also refer to Table 2-15). It is believed that more than half of the sample rice farmers experienced poor crop corresponding to less than one-third of normal crop. In Village KN, 89 out of 100 hectares of cultivated area are paddy field, most of which are rainfed paddy field for rainy season crop. In the dry season crop of 1998, pump irrigation became possible at 10 hectares of paddy field through the assistance of an NGO named Chivit Thmey. Rice cropping patterns of sample farm households are biased towards double cropping as 10 out of 16 sample households conducted double cropping in the 1997/98 cropping season. Although this village also suffered damages from the drought, the impact appears to be smaller compared to other two villages. As a result, this village where people are more dependent on agriculture, particularly rice farming, presents a contrast to Village AT (also refer to Table 2-15).

In our study of villages, the average number of family members living in the same house is 6 to 7, which is larger than the national average for rural areas of 4.9.<sup>6</sup> The percentage of family labor was relatively high—45% in Village P of Kandal Province, 40% in Village AT and 50% in Village KN of Battambang Province. The average education year

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<sup>6</sup> National Institute of Statistics, Ministry of Planning, "Socio Economic Survey of Cambodia 1996, Vol II Summary Results," June, 1997

of household head (defined here as “the largest income earner”) in Battambang Province is 1 or 2 years longer than those in Kandal Province.

The size of owned agricultural land is a little over 1 hectare in all villages. The size for the village in Kandal Province was larger than the provincial average of 0.84 hectares. In contrast, the size of owned agricultural land in Battambang Province villages was about 70% of the provincial average of 2 hectares even in Village AT that had relatively large farms, indicating that the areas selected for this study had relatively small farmland ownership compared to other areas of the province.<sup>7</sup> The area of paddy field in farmland was a little over 50% of all agricultural land for Kandal Province where cash crop production is more important than rice production while two-thirds for Battambang Province where rice farming is predominant. Land lease is commonly practiced in the study area and therefore the above average farm size is larger than the average size of owned land, particularly in Village KN. Farm size is largest in Village AT where rainy season rainfed lowland paddy farming is the most common. Land lease for upland crop is more common in Kandal Province while leasing of paddy field is more frequently observed in Battambang Province. Planted area of rice for Kandal Province was 0.49 hectares for dry season crop in 1998 harvest) in, which is greater than the provincial average of 0.38 hectares. In Battambang Province, the planted area in Village AT was 1.02 hectares for rainy season crop in 1997 harvest, while the area in Village KN was 0.89 hectare for rainy season crop and 0.41 hectare for dry season crop in 1998. They are larger than the average planted area in Village P, Kandal Province but is relatively small compared to other areas in Battambang Province.<sup>8</sup> Compared to the average yield in normal year of 1.5 to 2 tons for rainy season crop and 3 to 4 tons for dry season crop in Cambodia, yield of rice was low compared to normal year due to the drought in Village P of Kandal Province and Village AT of Battambang Province.

As for the ownership of agricultural fixed assets excluding farmland, many farm households in Kandal Province own pumps for dry season crop to draw water from colmatage canal while the farmers in Village KN have relatively large number of draft animals because a large number of rice farmers own draft animals for rice farming (13.out of 16 households).

Farm households in Village P, Kandal Province and Village AT, Battambang Province are not self-sufficient on rice as their production is less than the amount of household consumption. Although farm households are believed to have sufficient income to purchase the amount of rice they require, income level is quite low and falls below by large margin the poverty line for rural areas that was set by the Cambodia government in the First

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<sup>7</sup> Office of Agriculture, Forestry and Fisheries, Battambang, An Agro-Ecosystems Analysis of Battambang Province, November 1997

<sup>8</sup> Office of Agriculture, Forestry and Fisheries, op.cit.

Socioeconomic Plan (2,230,000 riels per household per year, 420,000 riels per person per year, 1996).<sup>9</sup> The effect severe drought in the year of the study will be discussed in greater detail below. The average farm household income in Kandal Province which is estimated based on the results of the 1996 Rural Socioeconomic Study and the increase rate of consumer price index (1,610,000 riels for the 1997/98 crop year), the average household income in the surveyed village is almost equal to this amount. No comparison can be made for Battambang Province due to lack of similar data.

A more detailed description of the factor endowment and resource utilization, the rural market surrounding individual farm households, the present situation of agriculture and technology and household income which is the fruit of economic activities, are given in the following section.

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<sup>9</sup> The Royal Government of Cambodia, First Socio-Economic Development Plan 1996-2000, 1996.

**Table 2-14 Outline of rural economy in surveyed households**

Region	Kandal Province	Battambang Province	
	Colmatage area	Lowland rice crop area	
		Village AT	Village KN
Number of Sample Households (Households)	25	12	16
Number of Family Members Living Together (Persons/Household)	6.08	7.17	6.69
of which are Working As Family Labor (Persons/Household)	2.64	2.92	3.56
Number of Years of Education Received By Householder (Years)	4.68	6.50	5.79 <sup>d</sup>
Area of Owned Farmland (ha/Household)	1.11	1.43	1.01
of which are paddy Area	0.61	0.89	0.68
Area of Rented Land (ha/Household)	0.15	0.13	0.34
Area of	0.02	0.05	0.02
Management Scale (ha/Household)	1.24	1.51	1.33
Rainy Season Rice Planted Area (ha/Household)	0.00	1.02	0.89
Rice Unhulled Yield (Ton/ha)		0.90	1.59
Dry Season Rice Cropping Area (ha/Household)	0.49	0	0.41
Rice Unhulled Volume (Ton/ha)	2.21		
Agricultural fixed asset other than land		-	2.28
Pump (units/household)	0.72	0.08	0.06
Draft cattle (heads/household)	1.00	0.50	1.94
of which are adult cattle	0.80	0.38	1.56
Farm income (riels/household)	1,637,137	1,610,476	1,011,766
of which are agricultural income	1,119,751	280,810	676,869
Dependence on farm income (%)	68.4	17.4	66.9
Farm income per person (riels/person)	269,266	224,613	151,236
Farm income per person in cleaned rice (kg/person)	269	225	151
Farm income per person in unhulled rice (kg/person)	448	374	252
Unhulled rice production per person (kg/person)	122	87	261
Farm debt (riels/household)	151,273	348,333	15,375

Reference: White rice consumption per capita is 151kg in average year (250kg in unhulled rice), accounting for 75% of total calorie intake from rice.

Note 1: The value excludes 2 households that did not know the years of education received by the householder.

Note 2: Calculated by estimating the rural selling price per 1kg of cleaned rice at 1,000 riels.

Note 3: Calculated by estimating the spot selling price per 1kg of unhulled rice at 600 riels.

## (2) Farmland distribution, labor utilization and livestock holding

Regarding farmland ownership, farm households owning 0.5 to 1.5 hectares of land account for a little less than 60% in both provinces, and the largest size is 2.5 hectares (of which 1.4 hectares are paddy field) for Kandal Province and 3.5 hectares (of which 2 hectares are paddy field) for Battambang Province. Such relatively equal distribution of farmland is related to the farmland reallocation in proportion to the number of household members through Kiom Samkki which has been implemented since 1979. Farm size distribution is



unequalized due to the land lease of medium size farmers who own 0.5 to 1.5 hectares. This is more common in Battambang Province (Table 2-15).

Table 2-16 shows the main occupations of farm household members. According to this table, agriculture is the most common occupation for both men and women. As for main occupations other than agriculture, daily wage labor (including unskilled work and skilled work such as carpentry), peddling, small shop management, government employee (municipality staff, primary school teacher) and factory labor have been reported. In Village AT, comparatively larger number of people are mainly engaged in non-agricultural works such as peddling and small shop management for women and daily wage labor for men. The fact that the larger number of household members are engaged in agricultural wage labor shown in Table 2-17 suggest that many farmers use hired labor in Kandal Province, as will be explained later. Another fact in this province that the relatively large number of the young population are working as factory laborers that can commute to Phnom Penh is distinguished from Battambang. Meanwhile, in Battambang Province, female household members often engage in peddling. In addition, due to the historically and geographically close relation with Thailand, working in Thailand is an important job opportunity for skilled workers such as carpenters and welders in Village AT. Very few cottage industries can be observed in all of the villages.

With regard to livestock holding, many farm households in Village P of Kandal Province and Village KN of Battambang Province are raising humped cattle as draft animal. Every farm household in Village KN has an average of 2 cattle (1.56 adult cattle) whereas there is only 1 cattle for every 2 households in Village AT.<sup>10</sup> None of the villages were raising water buffaloes.

Pigs are raised for commercial purpose. With the exception of a hog raiser in Village AT that was raising about 10 pigs, farm households usually have 1 or 2 pigs. Chickens are raised for home consumption and are sold when they have surplus. In Kandal Province, a relatively large-scale commercial duck raising is practiced by using the back swamps of a natural levee. Smallness of the number of animals raised in Village AT may be related to the comparatively larger non-agricultural employment opportunities offered by agriculture (refer to Table 2-18).

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<sup>10</sup> When procuring a cow, 1) a practice called "Bomngvas" in which a person takes care of another person's cattle and receives its calf for free, and 2) receiving a calf from a relative for free are being reported.

<sup>11</sup> JICA, Office of Agriculture, Forestry and Fisheries of the Royal Government of Cambodia, "Final Report on the Mekong River Environmental Adaptive Agricultural Development Project Study (Synopsis)," March 1998

**Table 2-15 Distribution of farmland**

Scale	Kandal Province		Battambang Province			
	Scale of ownership	Scale of management	Scale of ownership		Scale of management	
			Village AT	Village KN	Village AT	Village KN
$0 < < 0.5$	2	3	1	2	2	3
$0.5 \leq < 1.0$	10	7	3	6	1	5
$1.0 \leq < 1.5$	4	6	2	5	1	2
$1.5 \leq < 2.0$	6	5	3	1	5	2
$2.0 \leq < 2.5$	3	2	1	1	1	2
$2.5 \leq < 3.0$	0	1	1	0	1	1
$3.0 \leq$	0	1	1	0	1	1
Total	25	25	12	15	12	16

**Table 2-16 Main occupation of farm household members**

Region Occupation	Kandal Province		Battambang Province			
	Male	Female	Village AT		Village KN	
			Male	Female	Male	Female
Agriculture	24	27	9	10	18	30
Non-agricultural wage labor	1	0	2	0	2	0
Carpenter, plasterer, welder etc.	2	0	3	0	0	0
Driver	2	0	0	0	1	0
Commerce	0	2	2	7	0	4
Cottage industry	1	1	0	0	0	0
Midwife	0	0	0	1	0	0
Factory wage labor	0	4	0	0	1	0
Public servant	2	0	1	0	2	0

**Table 2-17 Status of non-agricultural employment among farm household members**

Region	Kandal Province	Battambang Province
Occupation		
Agricultural wage labor	6	1
Non-agricultural wage labor	5	5
Carpenter, plasterer, welder etc.	2	4
Driver	2	0
Commerce	2	12
Cottage industry	1	1
Well digging	0	1
Forestry (tree felling, firewood collection)	0	2
Midwife	0	1
Factory wage labor	3	1
Public servant	2	3
Total	23	31

**Table 2-18 Number of livestock raised**

Region	Kandal Province	Battambang Province	
		Village AT	Village KN
Type of livestock			
Adult cattle	0.80	0.38	1.56
Calf	0.56	0.12	0.38
Pig	0.40	1.00	0.25
Chicken	7.16	1.92	2.88
Duck	6.72	0	0.13

**(3) Prices of agricultural products and inputs, and rural market**

Table 2-19 shows the prices of major agricultural products in the last 12 months. The prices in Battambang Province in terms of Thai bahts were converted into riel at an exchange rate of 1 baht to 100 riels. Rice prices differed considerably between lean season and harvesting season, although no significant difference was recognized between the two regions. Although the prices of milled rice seem to be higher in Kandal Province, no clear difference existed in terms of average price (1,143 riels in Kandal Province and 1,065 riels in Battambang Province). Price of sugarcane in the surveyed village was much cheaper than in

Kampong Thum Province where it could be sold for 500 riels to the sugar mill. There was no difference in pig and chicken prices between the 2 regions but cattle was more expensive in Battambang Province, presumably reflecting the difference in the situation of supply and demand between the 2 regions and underdevelopment of the live cattle market.

Wages and rents are as shown in Table 2-20. As for the wages of daily hired labor and government employees, we were not able to observe any clear difference between the two provinces. However, workers of modern plants in Kandal Province earn nearly 4 times more salary compared to those working at traditional brick factories in Battambang Province. In addition, daily wages for carpenters are 3 times higher in Thailand compared to Battambang Province.

About 40% of surveyed farm households are leasing farmland. In Kandal Province, lease of fields for upland crop is more common, and the tenancy form is exclusively fixed cash rent tenancy. On the other hand, leased land in Battambang is mostly paddy field and the tenancy form is generally fixed in kind rent tenancy. The level of rent is a little over 10% of income for sugarcane production in Kandal Province, 20 to 30% of normal year yield in the case of single rice crop in rainy season and 17 to 18% of normal year yield in the case of dry season rice crop in Battambang Province.

In Kandal Province, one-third of farm households are using tractors for land preparation but all of them are rented. No difference existed in the rent for pumps between the 2 regions.

The rent for draft animals reflects the difference in supply and demand situation of the market in the same manner as the selling price of cattle. The cost of renting 2 cattle in for one day in Kandal Province is 15,000 riels which is more than 2 times higher than that in Battambang Province. In order to compare the economic efficiency of tilling the farm land by draft animals with that in the case of using tractors, we estimated the cost of tilling a hectare of farm by rented draft animals on the basis of an assumption from our study results that it takes 16 days to till one hectare of farmland by two cattle in dry season. According to this estimation, the rent would amount to 240,000 riels in Kandal Province and 110,000 riels in Battambang Province. Provided that the amount needed for renting tractors is the same between the 2 provinces, it would be cheaper to use tractors in Kandal Province and cheaper to use draft animals in Battambang Province. Thus, it is economically more advantageous to use tractors in Kandal Province and use draft animals in Battambang Province.

Costs of input such as fertilizer and pesticides are shown in Table 2-21. Farmers usually purchase from merchants and neighbors in Kandal Province. In contrast, farmers in Battambang Province use their own seeds or obtain them from other farmers. The high price of dry season IR variety seeds in Battambang Province, suggests that their market distribution is still underdeveloped.

No difference of chemical fertilizer, agricultural chemical and oil prices exists among the regions. Rodenticides are used in Kandal Province and pesticides for crabs are used in Battambang Province. Diesel oil is used for running the pump.

**Table 2-19 Farm Produce Prices (August 1997-August 1998)**

Region	Kandal Province	Battambang Province
Type of produce		
Unhulled rice (riels/kg)	392-667	300-600
Cleaned rice (riels/kg)	1,000-1,875	870-1,200
Sugarcane (riels/dozen)	1,000	-
Orange (riels/piece)	-	11.25-115.4
Cattle (thousand riels/head)	900-1,250	400-600
Pig (thousand riels/head)	100-300	150-200
Chicken (thousand riels/head)	3.5-5	3-6

Note: Farm spot-sale prices except for cleaned rice prices.

**Table 2-20 Wages and rent (August 1997-August 1998)**

Region	Kandal Province	Battambang Province
Farm labor (riels/person/day)		
Rice-planting	2,500-3,000 (2917)	3,000 (3000)
Harvesting/threshing	3,000-5,000 (3286)	3,000-3,500 (3250)
Daily hire wages (riels/person/day)		
Unskilled	2,000-5,000 (3625)	2,400-5,500 (3650)
Carpenter (Cambodia)		5,500
Skilled Carpenter (Thailand)		150 bahts/person/day
Welder (Thailand)		300 bahts/person/day
Factory worker salary (monthly)	40US\$	43,000 riels
Public servant salary (riels/month)	10,000-25,000	10,000-80,000
Rent		Unhulled rice 450-600kg/ha (rainy season only)
Paddy	200-1,000 thousand riels/ha	Unhulled rice 600-640kg/ha (1 year) 80-375
Field (thousand riels/ha)	100-250	80-375
Rent for agricultural machinery		
Tractor (thousand riels/ha)	40-130 (73.25)	
Pump (thousand riels/ha)	192-408	219-312
Rent for draft animals (thousand riels/ha)	(230.32)	(250.25)
Two cattle	15	3.75-11 (6.74)

Note: Figures inside parentheses indicate simple average value.

**Table 2-21 Cost of input (August 1997-August 1998)**

Region	Kandal Province	Battambang Province
Seeds (riels/kg)		
IR72		800-1,200 (1000)
IR66	667	
Chemical fertilizer (riels/kg)		
Urea		800-1,000 (862.5)
16-20-0		720-1,200 (884)
15-15-15		950-1,000 (975)
C-20		840-900 (870)
Agricultural chemicals		
Rodenticides (thousand riels/liter)		20-40 (30)
Pesticides for crabs ((thousand riels/bottle)		2.3-3.5 (29.3)
Pesticides (thousand riels/liter)		10-16 (12.7)
Diesel oil (riels/liter)		1,000-1,500
Machine oil (riels/liter)		2,667-3,000

Note: Figures inside parentheses indicate simple average value. Standard prices for diesel oil and machine oil are 1,500 riels/liter and 3,000 riels/liter, respectively.

#### **(4) Rice farming in surveyed villages**

We will explain the rice farming practices by farmers in our study area under the market structure shown above.

##### **i) Rice farming technology of sample households**

###### **a. Mechanization (Table 2-22)**

As can be seen from what has been mentioned above, mechanization of rice farming is comparatively advanced in Kandal Province. Diffusion of water pumps for dry season irrigation started around 1985. There are a few farm households using traditional irrigation methods today but the majority of farm households depend on pumps for irrigation. Although pumps are available on lease, it is more common for each farm household to have their own small pump. Half of farm households are still using cattle for land preparation while a third of farm households are using tractors, which reportedly came into wide use around 1994. In contrast, the farm mechanization has not yet progressed in Battambang Province. It was not until 1996 when water pump started to be used after an NGO irrigation project was launched that farm mechanization started. As mentioned earlier, the determinants of tractorization are the better soil condition and the cheaper rental price of tractor.

b. Varieties (Table 2-22)

In Kandal Province where dry season crop is grown, all farm households are using IR varieties such as IR 36, IR 42, IR 62, IR 64 and IR66. IR varieties started to spread at the same time as pumps around 1985. Most farm households purchase their rice seeds. In Battambang Province, high yielding varieties are not used because water management is not possible during the rain season. However, only a few cases of planting two or more local varieties having different growing periods to prevent risk and avoid competition for labor were observed. Farmers plant various varieties from early-maturing to mid- and late-maturing by taking into consideration factors such as yield, climate condition, water condition of the paddy field and taste (as they are grown for home consumption). As many as 20 types of rice varieties were reportedly adopted among farmers. Varieties that were commonly used in the year of the study included *Kong-man-kat* (mid-maturing), *Kong-Khsay* (mid-maturing), and *Neang-sor* (mid-maturing). Seeds for local varieties are mostly obtained from rice stock kept for this purpose at home or by exchange with other farm households. IR72 and *Ken-sar* (both early-maturing varieties) were used for dry season crop in Village KN. IR varieties were introduced at the same time as dry season crop in 1996. Therefore, most of the farmers just started to use IR varieties. Farmers who had never used IR varieties purchase their rice seeds. Other farmers procure their seeds from rice stock kept at their home or through exchange with other farm households.

**Table 2-22 Status of agricultural technology introduction (rice crop)**  
(number of farm households that have adopted the technology)

Region	Kandal Province		Battambang Province	
			Village AT	Village KN
Type of technology				
Introduction of farm machinery				
Pumps	21		0	9
Tractors	8		0	0
Machine thrashing	2		0	0
Chemical fertilizers	20		5	16
Variety	IR variety 23		Local variety 11	Local variety 16
IR 10 (dry season)	(rainy season)		(rainy season)	IR variety 10 (dry season)
			(IR72/7, ken-sar/3, D7/1)	
Hired labor	21		7	2
Rice planting	n.a.		6	16
Double cropping	1		0	10
Number of rice farms	23		11	16

**Table 2-23**

	Recession rice farming		Rainy season rainfed lowland rice farming		Irrigated lowland rice farming
	Traditional technology	Improved technology	Traditional technology	Improved technology	Modern technology
Seed (kg/ha)	80	80	80	80	n.a.
Fertilizer (kg/ha)					
Urea	50	100	0	50	50
DAP	0	0	0	75	100
16-20-0	0	0	0	0	100
Labor (person/day)	170	166	110	120	150
Yield (ton/ha)	2.7	3.3	1.3	2.0	2.5

Source: Nesbitt, H.J., Rice Production in Cambodia, Cambodia-IRRI-Australia Project (CIAP), 1997, pp.11-12 for recession rice farming and rainy season rice farming. World Rice Statistics 1993-94, 1995, IRRI, p.226 for irrigated rice farming.

c. Input of seeds, fertilizers, pesticides and hired labor (Table 2-22,2-23 and 2-24)

In Kandal Province, the amount of seed input is more than 2 times greater compared to the standard model case in Cambodia (refer to the table below) and exceed the optimal level. Input in Battambang Province is slightly larger than the standard.

Chemical fertilizers are used by 80% of farmers in Kandal Province and by 100% of farmers in Village KN of Battambang Province. In Village AT, more than half of farmers is not using chemical fertilizers. The amount of chemical fertilizer input is at the standard level for rainy season in both Kandal Province and Battambang Province, and is also about the same as in IRRI's irrigated paddy model case for dry season in Battambang Province. As for manure, only 3 farmers in Battambang Province were using manure by mixing it with chemical fertilizers.

Many farm households were using rodenticides in Kandal Province because of a serious rat damage. In Battambang Province, many farm households were using pesticides to deal with attack of crabs. However, pesticide application for pest control was not common in either province.

Regarding labor input, many farmers in Village P in Kandal Province and Village AT in Battambang Province used hired labor while almost all farm households in Village KN depended on family labor. The amount of labor input was at the standard level, except in Battambang Province where it was slightly excessive in rainy season and clearly excessive in dry season. Although direct sowing is said to be common in Battambang Province, more than half of the farmers in Village AT and all farmers in Village KN practiced transplanting.



**Table 2-24 Input of seeds, chemical fertilizers and labor (average)**

Region	Kandal Province	Battambang Province	
		Rainy season	Dry season
Input			
Seeds (kg/ha)	235	104	114
Chemical fertilizers (kg/ha)	123	111	229
Labor (person/day/ha)	n.a.	142	248
Of which are hired labor			

**ii) Profitability of rice farming**

Let us first examine the profitability of rice farming in all the sample farm households (Table 2-25). In Kandal Province, the yield of rice in dry season is higher and therefore the farmers in Village P have higher gross income compared to Villages AT and KN which are located in the rainy season rainfed rice growing area. Since damage from drought was relatively minor in Village KN due to availability of partial irrigation during the dry season, the farmers can earn higher gross income compared to Village AT. On the other hand, farm management cost per hectare in Village P of Kandal Province was more than 500,000 riels higher than the ones in the other two villages. In both villages in Battambang Province, the farm management cost is more or less 380,000 riels. The breakdown of farm management cost shows that land rent is the smaller in Kandal Province where lease of paddy field is uncommon, while it is the larger in Village KN where lease of paddy field is common. As for cost of fixed capital, the amount in Village P, the most advanced village in terms of mechanization, was not much different from that in Village AT, the less developed village. The cost of fixed capital is lowest in Village KN because the imputed fixed capital cost is lowest due to larger number of farm households owning draft animals. The amount of hired labor use for rice farming is the larger in Kandal Province owing to the labor intensive nature of recession rice farming compared to rainy season rainfed rice farming. In Village KN where rice farming is more labor intensive due to partial irrigation that exists in the village, farmers mainly use family labor instead of hired labor by taking advantage of their abundant family labor. The reason behind markedly higher expenses for current input in Village P, despite the fact that chemical fertilizer input is higher in Village KN where irrigated lowland rice farming is practiced, is that the amount of seed and pesticide input is larger. Net income, obtained by subtracting farm management cost from gross profit, was highest in Village KN and lowest in Village AT due to severe damage by the drought.

Nextly we examine the profitability of rice growing farmers that did not incur severe damage from the drought in the same manner to study the profitability of normal year crop by excluding the impact of drought damage (Table 2-26).

Compared to the cases that include damaged farm households, gross income per hectare increased by 50% in Village P, by 100% in Village AT and by 20% in Village KN, indicating the serious damage in Village P and Village AT. Farm management cost were 400,000 riels higher in Village P. The greater part of this cost can be explained by large input of seeds and diesel oil used for water pump, suggesting that farmers that had relatively small damage, attempted to prevent the damage from spreading by repeatedly seeding and pumping water from back swamps and colmatage canal in response to the drought. No significant difference in total farm management cost was observed for Battambang Province. The breakdown of expenditure shows no significant difference with the exception of fixed asset expenditure for Village AT being more than 100,000 riels lower than the others. Farmers that incurred little damage in Village AT expended the smaller amount of cost for fixed capital. This is because farmers owing enough draft animals in Village AT did not have to make high rental payment for draft animals and quickly responded to the change in climate condition. The net profits per hectare of three villages are almost the same. This indicates that the damage caused by drought and pest can explain the difference in the profits of all samples including the farmers that were not damaged.

**Table 2-25 Profitability of rice cropping at all surveyed farm households with usable data**

Region	Kandal Province		Battambang Province	
			Village AT	Village KN
Number of sample farm households	18		11	16
Planted area (ha/household)	0.65		1.02	1.17
Seed yield (t/ha)	2.21		0.90	1.76
Gross profit (riels/ha)	1,301,185		540,790	990,259
Management cost (riels/ha)	918,333		378,594	387,819
Land rent	2,778		18,595	54,131
Fixed capital	178,031		160,132	82,015
Hired labor	178,082		62,641	37,919
Ordinary input	559,443		146,174	213,754
Net profit (gross profit – management cost) (riels/ha)	337,304		162,197	602,441

Note: Self-supplied fertilizers such as manure are not included.

**Table 2-26 Profitability of rice cropping at surveyed farm households that did not incur serious damage from drought etc.**

Region	Kandal Province		Battambang Province	
			Village AT	Village KN
Number of sample farm households	9		4	10
Planted area (ha/household)				
Seed yield (t/ha)	3.25		1.78	2.69
Gross profit (riels/ha)	2,087,941		1,079,830	1,204,616
Management cost (riels/ha)	1,303,470		339,303	432,665
Land rent	0		51,136	30,931
Fixed capital	193,477		62,187.5	78,571
Hired labor	226,332		79,687.5	56,878
Ordinary input	893,660		146,292	266,285
Net profit (gross profit – management cost) (riels/ha)	784,471		740,526	770,951

Note: Self-supplied fertilizers such as manure are not included.

**Table 2-27 Rice crop production cost in rainy and dry seasons in the surveyed areas**

Region	Kandal Province		Battambang Province	
			Rainy season	Dry season
Number of sample farm households	9		13	6
Seed yield (ton/ha)	3.20		1.78	2.69
Production cost per hectare (thousand riels/ha)	1347.3 (1147.3)			
1)			946.4 (752.9)	1761.4 (1392.3)
2)			889.4	1707.5
Production cost per kilogram (riels/kg)	548.6 (358.5)			
1)			595.8 (423.0)	716.8 (517.6)
2)			511.9	661.2

Note 1: Estimated figures for Kandal Province do not include the evaluated amount of family labor. Three thousand riels per person per day, which is the most frequent figures for agricultural employment wages, was used as estimated family labor wages for Battambang Province.

Note 2: Two cases, namely 1) a case using market rent (270,000 to 360,000 riels) and 2) a case using the figure used in the production cost survey by the Ministry of Agriculture and Forestry in Cambodia (180,000 riels per hectare) are shown as estimated rent for farms in Battambang Province.

Note 3: The figures inside parentheses show the production cost when estimated family labor wages are calculated at 1,500 riels per person per day.

**Table 2-28 Production cost of rice cropping in Thailand**

	National	Central	Northeast	North	South
Rainy season					
Average yield (ton/ha)	2.00	2.58	1.68	2.34	1.98
Production cost per hectare (thousand riels/ha)	894.4	1003.8	814.0	974.8	1037.1
Dry season					
Average yield (ton/ha)	4.03	n.a.	n.a.	n.a.	n.a.
Production cost per hectare (thousand riels/ha)		n.a.	n.a.	n.a.	n.a.
Production cost per kilogram (riels/kg)	338.8	n.a.	n.a.	n.a.	n.a.

Note: Production cost in Thailand was converted at 100 riels to a baht.

Source: Agricultural Economics Bureau, Ministry of Cooperatives, Thailand

### iii) Production cost and profitability by type of rice farming

Three typical types of rice farming were observed in our study area. Observations in the previous section have revealed that the profitability of these three rice farming types, i.e. recession rice farming, rainy season rainfed lowland rice farming and dry season irrigated lowland rice farming, is more or less the same in a normal crop.

Although the Cambodian government has emphasized self-sufficiency and stable supply of rice as one of the top priority targets of economic development, it is questionable that Cambodia needs to strengthen the capability of stable supply of domestic rice although she can import rice from neighboring rice exporting countries such as Thailand and Vietnam. For this reason, to examine the global competitiveness of Cambodian rice we estimate the production cost of rice farming in Cambodia based on our study results and compare it with the cost in Thailand.

For this purpose, production cost was estimated for farmers that did not incur serious damage from the drought on each of the foregoing three types of rice farming (Table 2-27). Since information on family labor input could not be obtained from Village P, it was estimated as 300,000 riels per hectare by using the aforementioned CIAP data and the amount of hired labor input in Table 2-26. When compared with the other types of rice farming, the production cost per hectare in Village P is lower than dry season irrigated lowland rice farming and higher than rainy season rainfed lowland rice farming. Production cost per weight unit is lowest in Kandal Province when market rent is used for estimating the estimated rent of the home farm. However, it is lowest for rainy season rainfed lowland rice farming in Battambang Province if the Ministry of Agriculture and Forestry data is used for estimating the imputed land rent. The production cost of dry season irrigated lowland rice farming is highest in both cases.

In the case of dry season irrigated rice farming, the unit weight cost of rice is generally lower than those in the other types of rice farming although its volume of inputs such as seed, fertilizer, pesticide, labor is larger compared to others. However, this is not the case for the dry season rice cropping in Village KN, Battambang, because of excessive labor use and lower yield in dry season irrigated rice farming practiced there.

When the foregoing estimated production costs are compared with those of Thailand, the costs in both regions were higher than those in Thailand (Table 2-28). This is mainly attributable to lower land rent in Thailand compared to Cambodia and significant advancement of labor saving mechanization in Thailand. Thus, under the assumption that the imputed family labor cost is equal to market hired labor wages, it must be concluded the global competitiveness of Cambodian rice is lower. However, this is not the case if we use the imputed family labor cost calculated by a lower wage than market hired labor wages, based on an assumption that Cambodian farmers are assessing the marginal cost of family labor (this is considered to be more realistic considering the realities of local labor market) (shown in Table 2-27). If the wage rate is set at one-half of the market rate, dry season irrigated lowland rice farming in Battambang Province will still be almost 200 riels more expensive per kilogram compared to Thailand. However, the cost in Kandal Province is less expensive than the average cost in Thailand and the cost in rainfed lowland rice farming in Battambang Province is less expensive than the cost for rainy season rice farmers in northeastern Thailand as well as national average cost of rainy season rice farming in Thailand.

Comparing these three types of rice farming by profit obtained by subtracting production cost from gross profit, profit per hectare is highest in Kandal Province at nearly 600,000 riels, followed by 100,000 to 200,000 riels of rainy season crop in Battambang Province. Dry season irrigated lowland rice farming shows the worst and negative profitability. Due to the different stages of economic development between Thailand and Cambodia, it is difficult to compare profitability of rice farming in these countries, but it is noteworthy that profit per hectare for dry season crop in Thailand amounted to 1,460,000 riels.

##### **(5) Farm household income**

Table 2-29 shows the farm household income and its breakdown in the surveyed villages. According to this table, in Village P of Kandal Province the rice income accounts for the smaller percentage although agricultural income accounts for larger percentage. This is believed to be somewhat related to the impact of drought and the rice income would not have fallen below 20% of household income had it not been for damage from the drought.

The livestock and cash crop income account for higher percentage because of their high profitability due to the geographical advantage (Table 2-30).

In Village AT, agricultural income accounts for extremely low percentage of household income while the non-agricultural income, much of which is earned from overseas workers in Thailand, accounts for as high as 80%. However, rice income would have accounted for more than 30% had it not been for the drought since profitability of rice is not necessarily low compared to other crops.

In Village KN, farm household income is lowest among the three villages despite the fact that damage on rice farming from drought was relatively small. Partly due to the fact that double cropping is possible in some areas, rice income accounts for more than 50%. Because the profitability per operated area exceeds 1 million riels if double cropping is practiced, percentages of income from field crops and fruits is small and rice farming bears higher profitability than field crops and fruits (Table 2-30). Non-agricultural income accounts for one-third of the total income, and one-third of this non-agricultural income is earned by working in freshwater fishing in Lake Tonle Sap. Little increase in income can be expected even on a year of normal rice crop. Under the present technological level, a question remains as to whether expansion of dry season crop area through construction of irrigation facilities would significantly increase the income level which is far below the poverty line.

Farm household income would not have exceeded the poverty line in any of the three villages even on a year of normal rice crop.

**Table 2-29 Farm household income and its details**

Region	Kandal Province	Battambang Province	
		Village AT	Village KN
Farm household income (riels/household)	1,637,137 (100)	1,610,476 (100)	1,011,766 (100)
Farm income	1,119,751 (68)	280,810 (17)	676,869 (67)
Income from rice cropping	28,751 (2)	46,643 (3)	557,275 (55)
Income from field crop and fruits	408,955 (25)	129,167 (8)	
Income from stock breeding	682,045 (42)	105,000 (7)	9,567 (1)
Non-agricultural income	458,068 (28)	1,259,667 (78)	345,867 (34)
Transferred income	59,318 (4)	70,000 (4)	0 (0)

**Table 2-30 Profitability of main farm products (riels/ha)**

Region	Kandal Province	Battambang Province	
		Village AT	Village KN
Rice	337,304 (784,471)	162,197 (740,526)	602,441 (770,951)
Orange	-	-	910,417
Sugarcane	1,446,905	-	-
Maize	130,317	-	750,000
Red pepper	1,120,218	-	-

Note: Figures inside parentheses are average from farm households that did not incur severe damage from the drought.

## **CARERE and ACLEDA**

In Cambodia, many UN organizations, aid organizations of various countries and NGOs are engaged in rehabilitation of the Cambodian economy. This section will outline the activities of CARERE and ACLEDA—two projects led by UNDP for the rehabilitation of rural economy. It goes without saying that Japan's overseas development aid should start by supporting the rehabilitation of the impoverished rural villages. Cooperation with these projects will be indispensable when engaging in such activities.

### **(1) CARERE (Cambodia Area Rehabilitation and Regeneration Project)**

CARERE started its activities in 1992 after the conclusion of the Paris Peace Treaty. The purpose of the project at the time was to assist the repatriation of refugees and was called the Cambodia Resettlement and Reintegration. For this reason, areas of its activities were limited to the western provinces that share borders with Thailand (Bantey Mean Chey, Battambang, Seim Reap and Pursuat) and Ratanakiri Province in the northeast. Then the project shifted its emphasis to a more long-term rural development support and changed its name to CARERE (2).

Unlike its predecessors, CARERE (2) decided to support SEILA (meaning “keystone” in Khumer), a rural development project of the Cambodian government, through planning, funds and operation. SEILA is attempting to make decisions related to rural development under a decentralized system. This is because the central government has abandoned the idea of centralized rural development due to financial difficulty. For the same reason stated above, rural development projects supported by CARERE (2) are conducted in the same regions where refugee repatriation project was carried out.

The activities of CARERE (2) center on creation of income opportunities, implementation of small-scale infrastructure construction project, and offering of fundamental social services in rural areas. For this purpose, efforts are being made for formation of VDC (Village Development Committee), CDC (Commune Development Committee) which are based on the unit consisting of several villages, and PRDC (Provincial Rural Development Committee). They signify nothing but formation of local administrative organizations. Therefore, CARERE plays an important role, particularly in regions where local administrative bodies were destroyed under the control of Pol Pot. (However, some argue that this is not the result of Pol Pot influence and that rural organizations never existed to begin with in Cambodia.)



## **(2) ACLEDA (Association of Cambodian Local Economic Development Agencies)**

ACLEDA is an NGO supported by UNDP that offers loans to rural poor and small-scale enterprises. Its activities started in 1992. Its capital comes from concessional or no-interest loans offered by Sweden, Japan, New Zealand, USAID, EU and GTZ. In terms of the amount of loan offered, group loans similar to Gramin Bank (intended only for women) account for 40%, individual loans account for 50% and loans to small-scale factories account for 10%. The latter two loan types are secured loans. Ninety-three percent of borrowers are women, and the purpose of loan include production (34%), service (19%), commerce (21%) and agricultural production (26%). Among small-scale companies are fish sauce producers, tile producers, furniture manufacturers and banana farms. Interest rate is set at 5% per month for group loans and 25% per year for other loans. While repayment can be made on weekly, biweekly and monthly bases, principal is repaid in installments in addition to the interest at that time. Therefore, the actual interest rate is double of the rate shown above.

As of July, 1998, ACLEDA operates in 11 provinces, offering a total of US\$5,495,136 to 6,360 farm households. An average amount of \$1,409 is offered as loan for an average period of 14.4 months. Repayment rate is at a high level of 95.7%. However, the actual repayment rate is unknown since rescheduling is offered to delayed repayments and its details are not available. As far as group loans are concerned, loans are being offered to 9,036 groups with membership totaling 48,393. Outstanding loans amount to 11.539 billion riels and the repayment rate is as high as 97.4%. These loans are offered for an average period of 6.5 months.

While many small-scale loans that cover only several villages are offered by NGOs, those covering the entire country is limited to few organizations such as ACLEDA. ACLEDA is trying to become an agricultural bank in the future and may become an important organization for Cambodia which does not have a national-scale agricultural bank. In such an event, cooperation between ACLEDA and NGO financing activities will become essential.

# **Chapter Three**

## **Tasks Related to Agricultural Development —Implications of the Case Study**

### **1. Tasks Related to Agricultural Development**

An important conclusion drawn from the case study based on a field survey was the fact that traditional rice cropping in Cambodia possesses rationality in its own way by adapting to the natural environment characterized by enormous uncertainty. It goes without saying that further study and research are needed to reach this conclusion in general terms since this inference is based on limited information. Nevertheless, in the event this hypothesis proves to be realistic, the development of Cambodian agriculture centering on rice cropping will have to be examined from the viewpoint of identifying the direction of re-construction amidst traditional agriculture. The tasks of agricultural development in the surveyed regions can be summarized from such standpoint as follows.

#### **(1) Tasks related to rainy season rainfed paddy rice cropping**

Rainy season rainfed paddy rice cropping in the Battambang Province can be considered as rational agriculture that is suited for unstable conditions of the natural environment. Nevertheless, people are compelled to live with low productivity under limiting factors such as unstable rainfall, use of low-yield local varieties that are suited for rainfed rice cropping and has good taste, fertility of soil which is said to be lower compared

to flood plain regions in the basins of the Mekong, the Basaack and the Tonle Sap Rivers, animal damages caused by rodents, birds and crabs, insufficient renewal of seeds, poor growth caused by inferior storing condition of rice seeds owing to lack of storage facilities, and shortage of animal force. Significant improvement of productivity should be possible if these limiting factors could be overcome at least in part.

To this end, the tasks that must be undertaken would include, for instance, improvement of local varieties that are currently used to varieties that are superior in terms of resistance to drought and flood, equipping of seed production and supply system to support renewal of seeds for farmers, crop rotation with legumes to improve soil fertility, transfer of collective pest control technology for preventing damage from rodents, crabs and birds and diffusion of cow renting system similar to “Bomngvas” system to overcome the shortage of cows.

## **(2) Tasks related to dry season irrigated paddy rice cropping**

Dry season irrigated paddy rice cropping has low profitability and poor production efficiency in this region. Major factors behind this reality include: 1) inefficiency of irrigation facilities originating from inferior design and maintenance; 2) the fact that this type of rice cropping is accompanied by new technology requiring massive input of modern input factors such as modern varieties, chemical fertilizers and agricultural machinery and that the farmers are not able to meet this requirement owing to lack of capital and knowledge; and 3) undeveloped market environment for seeds, draft animals and agricultural machinery that would make introduction of such new technology beneficial.

Equipping of irrigation facility is the first prerequisite for improving the profitability of dry season irrigated paddy rice cropping. However, it is faced with many challenges such as the method for collective installation of water pumps and building of dams and waterways, means of paying for the construction and maintenance of public goods such as pumps, dams and waterways, and the method for forming the organization to manage these facilities. (Refer to 3. (2) i. for possibilities concerning pump irrigation.) While shortage of funds and lack of knowledge can be dealt through farmer credit system and expansion of diffusion system, respectively, many difficulties are expected to accompany their implementation. (Refer to Chapter 3. (2) i.) for details on farmer credit system.) Other tasks would include equipping of system for renewal of modern seeds for dry season irrigated paddy rice cropping and their supply, appropriate technology suitable for market environment (e.g. use of draft animals, manual threshing, elaborate weeding by manual labor. and careful observation of field), and establishment of technical system for excessively labor intensive dry season irrigated paddy rice cropping. However, they pose a very difficult challenge owing to serious shortage of testing and research facilities as well as their staff.

### **(3) Tasks related to residing water period rice cropping using colmatage waterways**

Kandal Province is experiencing wash-out of wall surface in colmatage waterways that diverts the flood water containing clay from the Basaack River, sedimentation of dirt, damage of gate facility that adjusts flood water from the Basaack River and sedimentation of dirt in back marshes. This has made it difficult to secure sufficient irrigation water and is having serious effect not only on rice cropping but on cultivation of cash crops, chicken farms and fish farms. Therefore, their repair and improvement have become an urgent task and the project for improvement of colmatage waterways has been proposed as a candidate for ODA from Japan. The question is whether the beneficiary farmers can perform the maintenance themselves after the improvement of waterway is completed.

The regions irrigated by colmatage waterways are prone to drought and flood damage compared to regions equipped with irrigation facilities. In Kandal Province where the study was conducted, pumps were utilized to maximum to reduce the damage from drought. As substantiation of capital for purchasing pumps and draft animals is an effective means for reducing the risks associated with natural disasters, the task would be to establish the farmer credit system for farm household. In addition, development of improved varieties with superior resistance to drought and flood would be needed as in the case of rainy season rainfed paddy cropping since the regions are more prone to the impact of natural disasters compared to dry season irrigated paddy rice cropping.

While the foregoing comprises the main tasks of agricultural development that were identified from the hearing survey of farm households. Other important tasks that need to be considered include the following.

- (1) Field crops such as sugar cane and red pepper are profitable in colmatage farming areas. They are mainly produced for the domestic market and cannot be exported. However, export of farm produce and processed farm produce will have to be considered as the source of foreign exchange. Candidates of farm produce that can be processed for export in the long run include sesame (oil extraction), mung bean (bean-starch vermicelli) and maize (livestock feed). Technical improvement that would improve the productivity of these crops is therefore needed.
- (2) As indicated in Chapter 2. 2. Iii), livestock plays an important role as insurance in the event of emergency and as source of side income. Their death rate, however, is at a high level. Therefore, production of vaccine for livestock and diffusion of their vaccination will become one of the important tasks of the future.

- (3) Measures must also be taken against the “die-back” disease of oranges that are grown in large volume in Batdambang Province.
- (4) The development and diffusion of the aforementioned agricultural development require research and education facilities as well as personnel for farm management guidance, all of which are in great shortage. (For instance, there is only one personnel for every 3,000 households.) These facilities and personnel need to be expanded without delay.

## **2. Tasks Related to Population and Public Health**

According to an estimate by an expert in Population and Rural Village Section of the U.N. Economic and Social Council of Asia and the Pacific (ESCAP), population in Cambodia will exceed 19 million in 2020. It has been said for a long that Cambodia is a sparsely populated region. That may have been true in the past but present condition is rapidly changing. As discussed in the tasks related to agricultural development, population is not necessarily sparse considering the fact that Cambodian agriculture must be developed under the premise of highly uncertain natural environment.

According to the results of the hearing survey, farmland has decreased enormously during the present generation. In terms of statistics, population in Cambodia has doubled during the same period of time. This decline in farmland is clearly the result of population increase.

The fact that population increase has led to reduction of farmland may be suggesting that few arable land is available even though land is there as long as the uncertainties of the natural environment must be taken into consideration. If we cannot to rely on the premise that arable land will not be expanded through large-scale development, future increase of population in Cambodia will become a direct burden on the country.

Considering the fact that cultivated land, which is not by any means abundant under the present circumstances, must be shared by the population which is increase by 1.9 times in the next 20 years, population issues involving education, public health, primary health care and family planning must be addressed in a comprehensive manner from the viewpoint of seeking sound and sustainable development of agriculture and rural areas in Cambodia.

In reality, however, the results of the field study show that supply of education, public health, primary health care and family planning is far from meeting the demand that exists for such services. As can be seen from the research concerning inheritance, there is no cultural barrier against introduction of family planning as can be seen from the lack of clear preference for a male child in Cambodia. Therefore, diffusion of family planning starts with

meeting the demand for education, public health, primary health care and family planning in rural areas.

This is also important from the viewpoint of overall development of rural areas. While the actualities of education in Cambodia as a whole due to shortage of statistics on education, the results of the field study show that only 17.4% of those entering the first grade graduate from the 6-year elementary school. While statistics are not available regarding this matter, it suggests that functional literacy rate is very low in rural Cambodia.

Needless to say, advanced management skills including IPM (Intensive Pest Management) are needed to achieve increased food production and realize sustainable farming, which, in turn, makes fundamental education of farmers indispensable. Functional literacy rate refers to an ability to write any necessary document without difficulty rather than being able to barely read letters. Extremely low functional literacy rate, combined with serious shortage of agricultural advisors, will make introduction of IPM very difficult. It can therefore be concluded that supply of education, public health, primary health care and family planning is indispensable for agricultural and rural development in Cambodia.

# Chapter Four

## Survey Members and Itinerary

### 1. Survey Members

#### (1) Committee in Japan

Dr. Sigeto Kawano	Emeritus Professor, The University of Tokyo
Dr. Yonosuke Hara	Director, The Institute of Oriental Culture, The University of Tokyo.
Mr. Yukio Imamura	Professor, Kantou Gakuen University Former Ambassador to Cambodia
Dr. Seichi Fukui	Professor, Osaka Gakuin University
Mr. Akihiko Ohno	Associate Professor, Osaka City University
Mr. Takashi Kwai	Former JICA Expert
Ms. Naoko Amakawa	Researcher, Institute of International Developing Economics
Mr. Mitsuru Sonoe	Graduate school of Kyoto University
Mr. Hirose Tsuguo	Executive Director/ Secretary General, The Asian Population and Development Association (APDA)
Mr. Osamu Kusumoto	Senior Researcher, APDA
Ms. Haryo Kitabata	Manager, International Affairs, APDA
Ms. Chiharu Hoshiai	Chief, International Affairs, APDA

**(2) Study Mission Member (from 16<sup>th</sup> August to 5<sup>th</sup> September)**

- |    |                    |                                            |
|----|--------------------|--------------------------------------------|
| 1) | Dr. Seiichi Fukui  | Professor, Osaka Gakuin University         |
| 2) | Mr. Akihiko Ohno   | Associate Professor, Osaka City University |
| 3) | Mr. Mitsuru Sonoe  | Graduate school of Kyoto University        |
| 4) | Mr. Osamu Kusumoto | Senior Researcher, APDA                    |

## **2. Cooperators**

**(1) Japan Embassy and JICA**

Masaki Saito	Ambassador of Japan
Yoichi Kakita	First Secretary
Masatoshi Teramoto	Assistant Resident Representative of JICA Cambodia Office
Hiroshi Kudo	JICA Expert
Hiroshi Okudaira	JICA Expert
Kasumi Nishigaya	JICA Expert

**(2) The Royal Embassy of Cambodia in Japan**

Truong Mealy	Ambassador
Theam Chun Y	Minister
Ieu Kim Sreang	Counsellor
Phay Mondara	Second Secretary
Nguon Cheng	Third Secretary

### **ESCAP**

Jerrold W. Huguet, Population Affairs Officer, Population Division, ESCAP.



## **Government and Institutions**

Ky Lum Ang, M.P., Chairperson, The Committee of Economic Planning, Investment, Agriculture Rural Development, and Environment, National Assembly, The Kingdom of Cambodia.

Pok Yuthea, Senior Economic Advisor to Samdech Chea Sim (Chairman of National Assembly and Acting Head of State)

Sophath A Kao, Advisor to the First Prime Minister, Prime Minister 's Office

Sok Chenda Sophea, Secretary General, Council for the Development of Cambodia (CDC)

Try Meng, Director General for Technical Affairs, Ministry of Rural Development

Veng Sakhon, Deputy Director General of General Directorate of Irrigation Meteorology and Hydrology, Ministry of Agriculture Forestry and Fishery

Heng Meng Hok, Chief of Planning Office, in charge of International Cooperation, General Directorate of Irrigation Meteorology and Hydrology, Ministry of Agriculture Forestry and Fishery

Lauv Ny, Director, Department of Planning Statistics and International Cooperation, National Director PRASAC, Ministry of Agriculture, Forestry and Fishery

Kith Seng, Agronomist, Deputy Director, Department of Planning Statistics and International Cooperation, National Director PRASAC, Ministry of Agriculture, Forestry and Fishery

Meach Yady, Statistics Office, Department of Planning Statistics and International Cooperation, Ministry of Agriculture Forestry and Fishery,

Iraak Thaveak Amida, Statistics Office, Department of Planning Statistics and International Cooperation, Ministry of Agriculture Forestry and Fishery,

Lim Saody, Statistics Office, Department of Planning Statistics and International Cooperation, Ministry of Agriculture Forestry and Fishery,

Men Sothy, Statistics Office, Department of Planning Statistics and International Cooperation, Ministry of Agriculture Forestry and Fishery,

Chou Meng Tarr, Socio-Economist, Environment Unit, HRD and Environment Division, Mekong River Commission Secretariat

Samran Chooduangngern, Senior Advisor, Planning Unit, Policy and Planning Division, Mekong River Commission Secretariat

San Vanty, Chief Planning Office, Ministry of Agriculture, Forestry and Fishery

Hierk Menghuor, Advisor to the First Prime Minister, Director of Cabinet, Ministry of Foreign Affairs and International Cooperation

Chhong Toeun, Director of Asia and Pacific Department Ministry of Foreign Affairs and International Cooperation

Kao Samreth, Deputy Director, Asia and Pacific Department, Ministry of Foreign Affairs and International Cooperation

Sokha Lisa Sras, Cabinet Staff of Minister, Ministry of Foreign Affairs and International Cooperation

Mam Bunheng, Under Secretary of State for Health, Ministry of Health

Eng Huot, Director General for Health, Ministry of Health

Sam Sotha, National Director, CMAC (Cambodian Mine Action Center)

Niem Chouleng, Assistant Director, CMAC(Cambodian Mine Action Center)

Sim Samiddh, Chief of Cabinet, CMAC(Cambodian Mine Action Center)

Phan Sothy, Chief of Staff, CMAC (Cambodian Mine Action Center)

Hou Taing Eng, Director General, General Directorate of Planning, Ministry of Planning

Hing Chanmontha, Director, Public Investment Department, Ministry of Planning

San Sy Than, Director, National Institute of Statistics, Ministry of Planning

Thach Sem, Director General, General Directorate of labor and Vocational Training

Peter Cox, Cambodia-IRRI-Australia project

Solieng Mak, Cambodia-IRRI-Australia project

Huon Savang, Director, Geographic Department

Ith Sotha, Chief Technical Office, Geographic Department

Marilou Joanito, Local Capacity Building Advisor, CAREERE Battambang,

Kung Nunichan, Assistant Program manager, CAREERE Battambang

Ky Ka, CAREERE Battambang

So Phonnary, Manager, Product Development and Marketing Department,ACLEDA

Ek Dan. Deputy Branch Manager, ACLEDA Battambang Branch

Sok Chanrithy, Credit Officer, ACLEDA Battambang Branch

San Bun Man, Deputy Branch Manager, ACLEDA Battambang Branch

Tep Hean, Deputy Director of Agriculture Department Battambang

Chim Choeun, Chief, Administration of Agriculture Department Battambang

Stephanie Mernier, Credit Assistant PRASAC (Programme de Rehabilitation et d'Appui au Secteur Agricole du Cambodge)

Terry N. Woods, Rural Development Advisor, PRASAC (Programme de Rehabilitation et d'Appui au Secteur Agricole du Cambodge)

Paul Matthews, UNDP Resident Representative UNDP

Claire Van der Vaeren, Assistant Resident Representative, UNDP

Benoit Thierry, Charge de Programme Conseiller en Development Rural, UNDP

Hedi Jemai, UNFPA Representative

El Say, Director, PDRD-BTB, Provincial Department of Rural Development Battambang Province, Provincial Office

Bophana-Kim, Director General, Phnom Penh Chamber of Commerce

Pok Essaravuth, Assistant Director General, Pochentong Airport, Phnom Penh

### 3. Itinerary

From: 16th August - 5th September

Date		
August 16th (Sun)	11:00 Depart from Narita by JL 717 Arrive at Bangkok 15:15 (Sonoe, Kusumoto) 11:45 Depart from Kansai by JL 623 Arrive at Bangkok 15:30 (Ohno)	
August 17th (Mon.)	<ul style="list-style-type: none"> <li>• Material Collection (at Chulalongkorn University in Bangkok)</li> <li>• Visit to ESCAP Population and Rural Development Division. Briefing on Population and Rural Development in Cambodia from Dr. Jerrod W. Huguet</li> </ul>	
August 18th (Tue)	<ul style="list-style-type: none"> <li>• 11:00 Depart from Bangkok--Arrive at Phnom Penh 12:15 by TG696 (Ohono, Sonoe, Kusumoto)</li> <li>• Discuss about the survey program with local counterpart.</li> <li>• Visit to International Cooperation Division, Ministry of Foreign Affairs. Briefing on bilateral cooperation between Japan and Cambodia. Visit to the Embassy of Japan. Briefing on Agriculture and Rural Development in Cambodia from Mr. Yoichi Kakita, First Secretary.</li> <li>• Visit to Ministry of Foreign Affairs and International Cooperation. Briefing on Relationship between Cambodia and Japan from Mr. Kao Samreth, Deputy Director of Asia and Pacific Department.</li> </ul>	
August 19th (Wed)	<ul style="list-style-type: none"> <li>• Visit to Geographic Department. Briefing on rehabilitation of Mapping system in Cambodia.</li> <li>• Visit to Ministry of Agriculture Forestry and Fishery. Briefing on outline of agricultural situation in Cambodia and discuss about survey program.</li> <li>• Visit to Rural Development Department, Ministry of Rural Development. Briefing on outline of rural development in Cambodia from Mr. Try Meng, Director General for Technical Affairs, Ministry of Rural Development.</li> <li>• Visit to Cambodia Chamber of Commerce, briefing about the relationship between Japan and Cambodia and commercial crop production in Cambodia from Mrs. Bophana</li> </ul>	
August 20th (Thu)	<ul style="list-style-type: none"> <li>• Visit to CMAC. Briefing on present situation of mine and its problem from Mr. Som Sotha, National Director of CMAC</li> <li>• Visit to Mekong Committee. Briefing on Agriculture and Rural Development in Cambodia from Dr. Chou Mengtarr.</li> <li>• Visit to Cambodia Development Council, briefing on the outline of cottage industry from Mr. Sok Chenda, Secretary General of CDC.</li> <li>• Visit to Ministry of Foreign Affairs and International Cooperation. Discuss about survey schedule with Mr. Hierk Menghuor, Director of Cabinet</li> </ul>	

August 21st (Fri)	<ul style="list-style-type: none"> <li>• Visit to Department of Planning, Ministry of Planning. Briefing on National Plan of Cambodia from Mr. Hou Taing Eng, Director General, General Directorate of Planing.</li> <li>• Visit EU Project Office. Briefing on micro finance project in Cambodia</li> <li>• Visit to UNDP representatives. Briefing on International cooperation through UNDP</li> <li>• Visit to National Statistics Center. Briefing on the statistics of Cambodia and Data Collection.</li> <li>• Visit to UNFPA Representatives. Briefing on Population in Cambodia.</li> </ul>	
August 22nd (Sat)	<ul style="list-style-type: none"> <li>• Pay courtesy call to Mrs. Ky Lum Ang, M.P., Chairperson, The Committee of Economic Planning, Investment, Agriculture Rural Development, and Environment, National Assembly.</li> <li>• Visit to rural area along with Basaak River.</li> </ul>	
August 23rd (Sun)	<ul style="list-style-type: none"> <li>• 11:45 Depart from KIX - 15:30 Arrive at Bangkok (Fukui)</li> </ul>	
August 24th (Mon.)	<ul style="list-style-type: none"> <li>• Depart from Bangkok 12:15 Arrive at Phnom Penh (Fukui)</li> <li>• Visit to CIAP (Cambodia –IRRI- Australia-Project). Briefing on CIAP Project in Cambodia and material collection.</li> <li>• Visit to JICA Representatives. Briefing on Japanese ODA to Cambodia.</li> </ul>	
August 25th (Tue)	<ul style="list-style-type: none"> <li>• Visit to ACLEDA(Association of Cambodian Local Economic Development Agencies) headquarter. Briefing on micro finance project in rural area of Cambodia.</li> <li>• Visit to General Directorate of Irrigation Meteorology and Hydrology, Ministry of Agriculture, Forestry and Fishery. Briefing on irrigation in Cambodia from Mr. Veng Sakhon, Deputy Director General.</li> <li>• Visit to Department of Planning Statistics and International Cooperation, Ministry of Agriculture, Forestry and Fishery. Final coordination of field survey.</li> <li>• Visit to Ministry of Rural Development. Final coordination of field survey.</li> </ul>	
August 26th (Wed)	<ul style="list-style-type: none"> <li>• Move from Phnom Penh to Battambang survey area (by VJ438).</li> <li>• Visit to ACREDA Battambang Office.</li> <li>• Briefing on micro finance project in Battambang.</li> <li>• Visit to CARERE (Cambodia Area Rehabilitation and Regeneration Project) Battambang Office. Briefing on situation of Battambang Province and discuss about survey village in Battambang.</li> <li>• Visit to Provincial Agricultural Office. Briefing on agricultural and rural situation in Battambang.</li> <li>• Visit to Provincial Rural Development Office. Discuss about survey on rural area.</li> </ul>	
August 27th (Thu)	<ul style="list-style-type: none"> <li>• Visit to Survey Area (Kn Village).</li> <li>• Briefing about the village situation from village chief.</li> <li>• Conducts the field survey .</li> </ul>	

August 28th (Fri)	<ul style="list-style-type: none"> <li>• Conducts the field survey.</li> </ul>	
August 29th (Sat)	<ul style="list-style-type: none"> <li>• Visit to AT Village.</li> <li>• Briefing about the village situation from village chief.</li> <li>• Conducts the field survey .</li> </ul>	
August 30th (Sun)	<ul style="list-style-type: none"> <li>• Move from Battambang to Phnom Penh (by VJ 483)</li> <li>• Visit to Irrigation project in Kandar Province. Briefing about irrigation project from Mr. Pok Yuthea, Senior Economic Advisor to Samdech Chea Sim (Chairman of National Assembly and Acting Head of State)</li> </ul>	
August 31st(Mon)	<ul style="list-style-type: none"> <li>• Visit to Hun Sen project center. Briefing on Hun Sen Project.</li> <li>• Select the survey village (Commercial Crop Area, e.g, Vegetable and etc) along with Bassak river.</li> <li>• Visit to Pum Prey Som Ral village. Briefing about the village situation from village chief.</li> </ul>	
September 1st (Tue)	<ul style="list-style-type: none"> <li>• Conduct the field survey</li> </ul>	
September 2nd (Wed)	<ul style="list-style-type: none"> <li>• Conduct the field survey</li> <li>• Move from Survey area to Phnom Penh</li> </ul>	
September 3rd (Thu)	<ul style="list-style-type: none"> <li>• Visit to Ministry of Health. Briefing on Public Health, Birth Rate, Death Rate and Population Related issues from Dr. Nam Bunheng, Under Secretary of State for Health.</li> <li>• Visit to Ministry of Labor. Briefing on Outline of labor force and labor supply from rural area. From Thach Sem, Director General, General Directorate of labor and vocational Training.</li> </ul>	
September 4th (Fri)	<ul style="list-style-type: none"> <li>• Visit to Ministry of Agriculture, Forestry and Fishery. Report the survey results.</li> <li>• Visit to the Embassy of Japan. Report of the survey results.</li> </ul>	
September 5th (Sat)	<ul style="list-style-type: none"> <li>• Report of the survey results to Mr. Try Meng, Director General, Ministry of Rural Development</li> <li>• Depart form Phnom Penh --14:10 Arrive at Hong Kong by KA 201</li> <li>• Depart form Hong Kong --20:20 Arrive at Narita (Sonoe, Kusumoto) by NH 910</li> <li>• 16:25 Depart form Hong Kong --20:45 Arrive at KIX (Fukui, Ohno) by CX 502</li> </ul>	

## 4. Collected Material

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#### General Soil Map

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Jerrold W. Huguet, The Population of Cambodia, 1980-, 1996, and Projected to 2020, Sponsored by United Nations Population Fund, National Institute of Statistics, Ministry of Planning, Kingdom of Cambodia, 1997.(Original 2)

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# **APPENDIX**

## Questionnaire

No.

# Questionnaire for Village Head

Basic Survey of Agriculture and Rural Development by Progressive  
Stage in Asian Countries

Kingdom of Cambodia

Conduct by  
The Asian Population and Development Association  
1998

## Village Information

- 1) Name of Village:
- 2) Village Population:
- 3) No. of Household:
- 4) Area size of this village:
- 5) No. of Hospital
- 7) How far from here to hospital.
- 8) No. of primary school
- 9) No. of secondary school
- 10) How far from here to primary school                      KM.
- 11) How many percentage of children are they going to primary school.                      %
  - a. entrance
  - b. first grade
  - c. second grade
  - d. fifth grade/ Graduation for primary school
- 12) How far from here to secondary school                      KM.
- 13) How many percentage of children are they going to secondary school.                      %
  - a. entrance
  - b. first grade
  - c. Graduation for secondary school
- 14) How many children were born in this village past three Years
  - 1995
  - 1996
  - 1997
  - 1998 until now

**Land Area of Village**

1) Size of Village Area

- a. Cultivable land                      b. Cultivate Land                      c. Forest                      d. Others

2) How many areas are your village using for cultivate in detail.

- b-1 Paddy Field Wet Season                      b-2 Paddy field Dry season

- b-3 Swedden Land                      b-3 Others in specific

**Labor supply**

1) Any labor shortage during peak season? When and for what operations?

2) Is there seasonal migration of labor from neighboring areas?  
When and for what operations?

- 3) Do villagers go out of the village to work to nearby places?  
a. Who  
b. When  
c. What kind of occupations?

**Number of Live Stocks and Fish Ponds**

1) Number of Live Stock

	No.
1.Cows	
2.Calves	
3.Oxen	
4.Buffaloes	
5.Chickens	
6.Duck	
7.Turkey	
8.Goats	
9.Pigs	

2) Fish pond

Do your village have culture fish pond?

Number of pond	Size of each

### **Administrative Organization**

1) Please notify administrative organization of your village.

If possible, please notify historically changes of its.

2) Please notify the procedures of election of Village Chief.

### **Risk Fluctuation**

1) What kind of risk / fluctuation does your village have?

2) What kind of counter measure did you take?

Thank you very much.



# Survey Questionnaire

Basic Survey on Agricultural and Rural Development by Progressive Stage  
-Kingdom of Cambodia.-

Village:

Date of Interview:

Name of family head:

Household Number

*APDA*

## 1. Basic Information

### 1) Basic information of you

Name:

Sex:

Age:

Tribe:

Language:

Religion

Land size of cultivation:

Times of meal:

### 2) Basic information of your spouse

Name:

Sex:

Age:

Tribe:

Language:

Religion

## 2. Social Structure

1) Who will inherit your property among your children?

2) When you got married, where did you live:

- 1) your parents ( )
- 2) near by your parents ( )
- 3) spouse's parents ( )
- 4) near by spouse's parents ( )

3) If you can have only one child, which do you prefer to have boy or girl?

boy( ) girl( )

4) If you have boy and girl children, when they wish to go to school, but you have financial constraints. In this case, which will you choose either boy or girl for school? boy( ) girl( )

## 3. Population

1) Number of Children

- a. How many children have you had so far? ( )
- b. How many children do you have now? ( )
- c. How many children do you want? (ideal number of children)  
Total( ) (Boy ) (Girl)

2) Family planning

a. What kind of measure do you use for contraceptive.  
Condom. Pill. IUD. Natural (Rhythm) Method. Other (In detail. )

b. None.

c. Where did you get family planning information.

District Office Hospital. Provincial Office Hospital. Private Hospital Women's Union  
NGO ( ) Others ( )

b. Where did you get your family planning commodities?

District Office Hospital. Provincial Office Hospital. Private Hospital Women's Union  
Drug Store NGO ( ) Others ( )

c. Do you pay to obtain the contraceptive commodities? Yes or No.

In case of Yes, please tell us how much do you pay for contraceptive commodities?  
( Riel Month or Weeks)

#### 4. Public health

1) Do you have a lavatory in your house? Yes / No.

3) Where do you go in case of illness or delivery?

	Illness	Delivery
a. Hospital		
b. Clinic		
c. Health center		
d-1. Buy medicine at drug store		
d-2. Just take a herb medicine		
d-3. Just take rest at home		
e. others		

4) Did (or do) you breast feed your children. (Yes / No )

a. If you yes. How long did you feed the children by breast milk.

#### 5. Education

1) Your final educational career. (Husband / Wife )

2)-a If you have no educational career, can you read and write Cambodian language. (Yes / No )

2)-b If your husband or wife have no educational career, can he/she read and write Cambodian language. (Yes / No )

3) Your ideal educational career for your children.

## 6. Migration

### Emigration

- 1) Did you move from somewhere else to come here? Yes: No
- 2) Where did you stay before?
- 3) Reason of why you migrated to here.
- 4) How long are you living here?

Note:

### Immigration

- 1) How many persons have migrated to other area from your family (or Village)?
  - a. Where did they go?
  - b. Reason of why they have left this village.
  - c. Do you have any remittance from migrated persons?
  - d. Are there any family members who are willing to migrate to other area?  
In case of Yes, please notify the reasons.

## 7. Living condition.

- 1) Source of drinking water.  
What kind of source of drinking water do you use?
  - a. River
  - b. Well
  - c. Tapped water
  - d. Others (in detail: )

- 2) Have you boil water when you drink it.

## 8. Please notify any other specific desire/ request which you currently have?

MEMO

Thank you very much for your contribution.

No.

# Questionnaire

for

## Village Head

Basic Survey of Agriculture and Rural Development by Progressive  
Stage in Asian Countries

Kingdom of Cambodia

Conduct by  
The Asian Population and Development Association  
1998

Q.1 Please tell us of your household members who live together.

Relation	Sex	Age	Educational Background	Occupation		Remittance
				Main	Subsidiary	
1. Informant						
2						
3						
4						
5						
6						
7						
8						
9						

Q.2 Please tell us when you got your families land owned (Fill up plot by plot).

1. Paddy Field	(1) When	(2) Area
1)		
2)		
3)		
2. Other agricultural land		
1)		
2)		
3)		

Q. 3 Please tell us about land lease of your family.

Lease in/out	Area in Ha	Type of Contract	Rental	Remarks
in( ) out ( )		0 1 2 (L S O)		
i n( ) out ( )		0 1 2 (L S O)		
in( ) out( )		0 1 2 (L S O)		

0: 1 harvest  
 1: 1year  
 2: more than 1 year  
 L: leasehold  
 S: share tenancy  
 O: others

Q4 During the last year, how many ha did you plant and harvest on your agricultural land?

	Area Planted		Area Harvested	
	Rainy Season of Last year	Dry Season of This year	Rainy Season of Last year	Dry Season of This year
1				
2				
3				
4				
5				

Q5 What kind of machinery do you have?

	Year of purchased	Price when purchased	When shared (specify)
1 Cultivator			
2 Tractor			
3 Thresher			
4 Plough			
5 Pump			
6 Sprayer			

Q. 6 Livestock holding

		current price	price when purchased	When shared (Specify)	
1 Cows	No.				
2 Calves					
3 Oxen					
4 She-Bufferaloes					
5 He-Bufferaloes					
6 Baby Bufferaloes					
7 Chickens					
8 Goats					
9 Pigs					
10 Turkeys					
11 Others					

Q.7 Do you lease in or out cattle or machine?

Kind	Lease In/ Out	Rental Value per	How many
1			
2			
3			
4			
5			

Q.8 Please tell us about the historical change of agricultural technology and institutions practiced by your family( Technology or Institution).

Year	88	89	90	91	92	93	94	95	96	97
1. Rice variety (HYV adoption rate) and Productivity										
2. Multiple cropping										
3. Irrigation system										
4. Agricultural machines										
5. Draft animal										

**Q9-1 Selling and Purchasing paddy last one year**

(Kg, Price per kg, to and from Whom)

**Selling**

'98

Aug Sep Oct Nov Dec Jan Feb Mar April May Jun Jul Aug

**Purchasing**

**Q. 9-2 During the last year, what was the production of agricultural or non agricultural products? What was the amount of sales?  
To whom did you sell?**

(1)Name of product	(2) production		(3) Amount of sales	(4)Average sale's value	(5) To whom
	Rainy season	Dry season			

**Q 10 Please tell us how many you used hired labor, cattle or rental machine for your rice production during the last year.**

Stage of Cultivation	Rainy season			Dry Season		
	Hired Labor (Man/days)	Tractor/Animal (No./days)		Hired Labor (Man/days)	Tractor/ Animal (No./days)	
1. Ploughing, harrowing, leveling						
2. Seedling						
3. Transplanting, broad casting						
4. Irrigation						
5. Fertilizer application Pesticide application						
6. Weeding						
7. Harvesting						
8. Threshing						
9. Transportation						
10. Others						
11						
12						
13						
14. Total						



Q 11 Please tell us how many you used family & exchange labor, owned cattle or owned machine for your rice production during the last year.

Stage of Cultivation	Rainy season			Dry Season		
	Family Labor (Man/days)	Tractor/Animal (No./days)	Exchange Labor (Man/days)	Family Labor (Man/days)	Tractor/ Animal (No./days)	Exchange Labor (Man /days)
1. Ploughing, harrowing, leveling						
2. Seedling						
3. Transplanting, broad casting						
4. Irrigation						
5. Fertilizer application Pesticide application						
6. Weeding						
7. Harvesting						
8. Threshing						
9. Transportation						
10. Others						
11						
12						
13						
14. Total						

Q.12 Please tell us how much did you spend for the following current inputs in rice production during the last year. And from whom you bought or to whom you paid its expenses?

	(1) How much	(2) From / to whom		(1) How much	(2) From / to whom
1. Seed			6.Cultivator		
2 Fertilizer			7.Other's repairment		
3 Insecticide			8. Machine Oil		
4 Herbicides			9		
5 Tracor repairment			10		

Q.13 How many days did each of your family members work in the following works during the last year? And how much did he / she earn during the same period?

No. of household members (See Q1)								
	How many	How much	How many	How much	How many	How much	How many	How much
1. Agricultural Wage labor								
2. Non agricultural wage labor								
3. Trading								
4. Rice milling and other manufacturing								
5. Artisan (carpentry, smithy, masonry, etc.)								
6. Transport								
7. Working in government office								
8. Household industry								
9. Total								

Q14 Livestock holding

	No.	When purchased	Price when purchased	Remarks
1 Draught Cattle				
2 Calf				
3 Draught Buffalo				
4 Baby Buffalo				
5 Pig				
6 Poultry				
7 Others				

Q15 Selling livestock during last one year?

	No	Average selling price	To Whom sold	Particular Reasons of Selling, if any.	Net Income
1 Draught Cattle					
2 Calf					
3 Draught Buffalo					
4 Baby Buffalo					
5 Pig					
6 Poultry					
7 Others					

Q 16 Do traders including rice millers advance money for paddy? Yes [ ] No [ ]

When 'Yes', please explain its details.

Q 17 On which month is your family faced with deficiencies of rice most badly?

Q 18 Have you borrowed rice during last three years? Yes [ ] No [ ]

When Yes,

When

From whom

Interest Rate

Is it easy to borrow rice? Very easy [ ] Easy [ ] Difficult [ ] Very Difficult [ ]

Q 19 Have you lent paddy or money when requested last three years? Yes [ ] No [ ]

When 'Yes'

How much

To whom

Interest rate

Q 20 History of the loans during last three years ( Including borrowing from friends and relatives)

	When	Source from who	Amount borrowed	Interest rate	Term of loans	How much left to pay	what used for	collateral
1)								
2)								
3)								
4)								
5)								
6)								
7)								

Note: Loan Sources are Money lender, Trader, Relatives, Friends or neighbors, NGO and Banks.

Q 21 Suppose there are following loan sources

	Access	Amount of Loans	Seriousness
Money Lender			
Trader			
Relatives			
Friends or Relatives			
NGO			

i) Easiness: Please order the sources according to the easiness of access. (number 1 to 5 in order of easiness)

ii) Amount: Please order the sources according to the amount of loans you can borrow.  
1) enough 2) nearly enough 3) only small amount

iii) Seriousness: Suppose that you borrowed from the all and that you are in short of money for repayment. Please order the sources according to the possible seriousness associated with default. (number 1 to 5 in order of seriousness)