



S 822 KH95

CONSULTANTS FOR DEVELOPMENT

*Rural Development
Agriculture
Land & Water Management
Water supply & Sanitation
Institutional Development*

LIBRARY
INTERNATIONAL REFERENCE CENTRE
FOR COMMUNITY WATER SUPPLY AND
SANITATION (IRC)

UP TO THE SKY

A study on

GENDER ISSUES IN IRRIGATION IN CAMBODIA

in the provinces of Takeo and Prey Veng

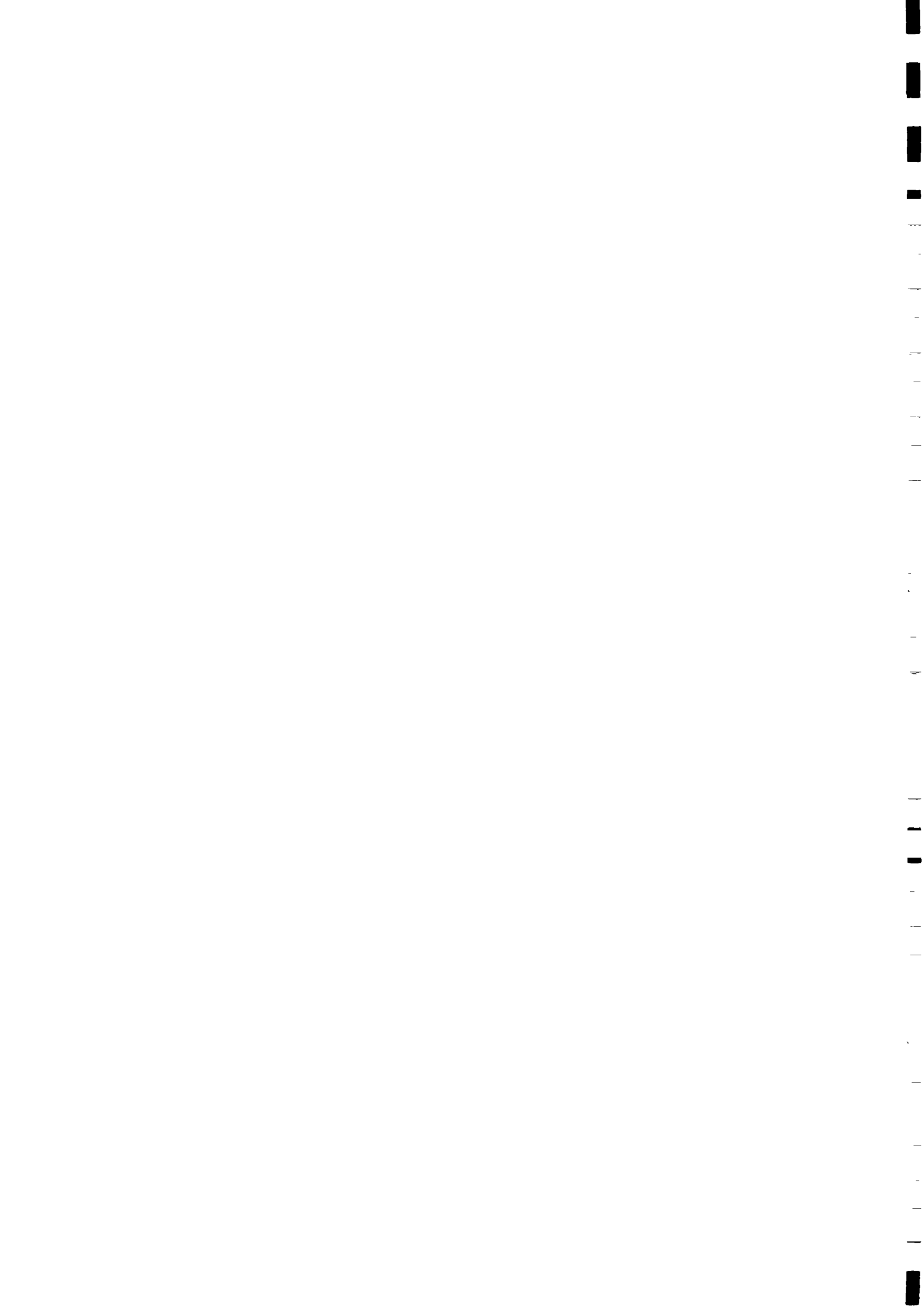


financed by: NOVIB
PSO
AFSC
CAA
CIDSE
LWS
MCC
OXFAM UK/I

Rhodante Ahlers
Sonja Vlaar
February 1995

SAWA, Beukenlaan 2^b 6711 NH EDE, The Netherlands
phone (0)8380-53380, fax (0)8380-51636

822-95-12591



SAWA - consultants for development - is a dutch consultancy organisation with a professional staff of 10 - 15 experts who carry out short and long term consultancies. Activities in Cambodia are supported by the SAWA- office in Phnom Penh.

SAWA's field of activities are institutional development, gender, rural development, agriculture, food security, land and water management, water supply and sanitation.

For information please contact:

**SAWA - The Netherlands
Beukenlaan 2b
6711 NH Ede
The Netherlands
phone: 31 - 8380 53380
fax : 31 - 8380 51636**

**SAWA - Cambodia
GPO Box 549
Phnom Penh
Cambodia
tel/fax 855 23 27568
tel/fax 855 23 62064**

CONTENTS

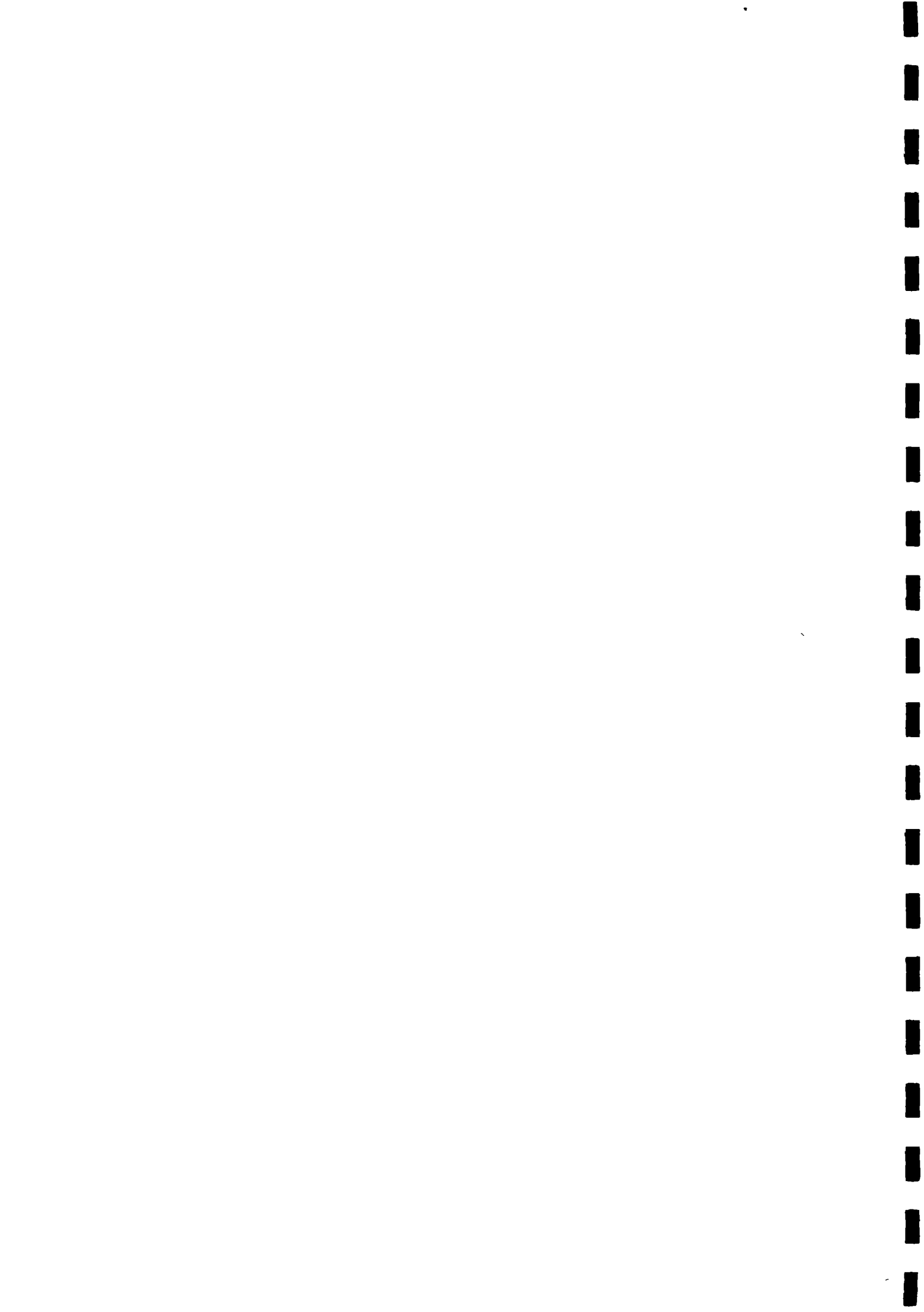
Summary	i
Acknowledgements	ii
1. INTRODUCTION	1
1.1. Background and justification of the study	1
1.2. Institutional setting of the study	1
1.3. Lay out and distribution of the report	2
2. OBJECTIVES OF THE STUDY	3
2.1. Objectives	3
2.2. Scope of the study	3
2.3. Limitations of the study	4
3. METHODOLOGY	6
3.1. The study approach	6
3.1.1. A participatory approach	6
3.1.2. Gender oriented	6
3.2. Composition of the study team	7
3.3. Phases of the study	7
3.4. Study sites	8
3.5. Methods	10
4. ANALYTICAL FRAMEWORK AND CONCEPTS	12
4.1. Gender analysis	12
4.1.1. The concept of gender	12
4.1.2. Units of analysis	12
4.1.3. Tools of analysis	13
4.2. Irrigation	14
4.2.1. The process of irrigation development	14
4.2.2. The definition of irrigation intervention	14
4.2.3. User's characteristics	15
5. INSTITUTIONAL INVOLVEMENT OF NGOS	16
5.1. NGO involvement in irrigation development	16
5.2. NGO involvement in Gender	17
5.3. NGO intervention in the study area	18
5.3.1. Farmer Participation in Irrigation development; MCC Prey Veng Irrigation project.	19
5.3.2. OXFAM KAM 215 Irrigation Programme, Takeo Province.	20
6. SOCIO-ECONOMIC SITUATION	22
6.1. National level	22
6.2. Village level	24
6.3. Household level	27
7. RICE CROPPING PATTERNS AND RELATED IRRIGATION PRACTICES	30
7.1. Overview of rice growing practices	30
7.2. Classification of Rice cropping patterns	32
7.3. Historic Overview of Irrigation practices	33
7.4. Actual water management and irrigation	34
7.4.1. Rainfed Lowland rice (1A and B)	34
7.4.2. Early Rainfed Lowland Rice (2A and B)	36
7.4.3. Late wet season recession rice (3A and B)	36
7.4.4. Flood Recession Rice (4)	37
7.4.5. Floating Rice (5)	38

LIBRARY, UNIVERSITY OF THE PHILIPPINES
 CENTRE FOR COMPRESSION AND GENETIC ENGINEERING
 P.O. Box 25100, 2509 MD The Hague
 Tel. (070) 8149 11 ext. 141/142
 RSA 12591
 LG: 882 KH95

7.5.	Irrigation intervention water management	39
7.5.1.	Irrigation in Krang	39
7.5.2.	Irrigation in Prey Sambuo	40
7.6.	Comparison between irrigation intervention and non intervention	41
8.	GENDER ANALYSIS	43
8.1.	Trends in History	43
8.2.	Labour	47
8.2.1.	Activities	47
8.2.2.	Daily time allocation	54
8.2.3.	Labour shortage	56
8.2.4.	Labour organisation	57
8.2.5.	Involvement of men and women in different rice cropping patterns	59
8.2.6.	Importance of rice in comparison with other income generating sources	59
8.2.7.	Conclusions	59
8.3.	Land	62
8.3.1.	Landownership	62
8.3.2.	Conclusions	66
8.4.	Capital	66
8.4.1.	Rice	66
8.4.2.	Cash	67
8.4.3.	Credit	70
8.4.4.	Tools	70
8.4.5.	Livestock	71
8.5.	Water	72
8.5.1.	Rain	72
8.5.2.	Ponds	72
8.5.3.	Reservoirs	73
8.5.4.	Village canals	73
8.5.5.	Rehabilitated Canals	74
8.6.	Knowledge	76
8.6.1.	Information	76
8.6.2.	Education	77
8.7.	Interaction of resources	78
8.7.1.	How resources interact	78
8.7.2.	Water in relation to other resources	79
8.7.3.	Differences between intervention and non intervention villages.	79
9.	GENDER ISSUES IN IRRIGATION: CONCLUSIONS AND RECOMMENDATIONS	80
9.1.	Introduction	80
9.2.	Gender Issues in Irrigation	81
9.2.1.	The changing agricultural production process	81
9.2.2.	Wet versus Dry season	83
9.2.3.	Resources	85
9.2.4.	Community organisation	86
9.2.5.	Female-headed Households	88
9.2.6.	Gender Education and Research	89

Annexes

Annex 1	Specific objectives of the study	1
Annex 2	Geographical maps:	
	2A: Cambodia	3
	2B: Takeo province	4
	Layout Intervention	5
	2C: Prey Veng province	6
	Layout Intervention	7
Annex 3	Selection criteria for the villages	8
Annex 4	Selected PA-methods	9
Annex 5	Historic time line	11
Annex 6	Short description of each village	12
Annex 7	Area and production figures for rice cultivation in Cambodia	20
Annex 8	Daily timelines	21
Annex 9	Land ownership	23



SUMMARY

Gender issues in irrigation were studied in three villages in the province of Prey Veng and three villages in the province of Takeo, Cambodia. The objective was to provide information and recommendations on gender issues related to irrigation practices.

Gender analysis combined with several participatory appraisal methods were used to explore gender issues in the communities. Households were classified by three categories:

- **de jure** female-headed households : these are households that are female-headed without any male support of a husband or partner throughout the year (widows/ divorced women / abandoned women / single women)
- **de facto** female-headed households : these are households that are headed by a woman, but receive some support from a husband or partner. The husband has migrated temporarily, but contributes financially or materially to the household)
- **couple-headed** households where both husband and wife run the household.

The differences between the villages were characterised by different rice cropping patterns and the possibility to produce sufficient rice to fulfil the community needs. In villages where not enough rice for consumption is produced, men temporarily migrate to seek other income, leaving the women to run the farms. Irrigation practises, land size and land quality were other differences between the villages studied.

Social differentiation between households is accelerated by the process of market privatisation. The boundaries between social strata are defined by the access to labour and draught-animals. As water is not scarce and rice production in most villages is not commercially attractive, access to water is not decisive for socio-economic improvement of the household. However, the means to get the water to the field determine if the household can make the water productive. These means are labour, tools and information, which can also be utilized for other economic purposes.

For this reason farmers in one village (Prey Sambuo) organised themselves on the basis of the economic use of tools and labour. In another village (Krang) the water-users organisation, supported by an NGO, did not prove to be effective, because the use of water for irrigation of rice is not the main concern of the farmers.

Villagers expressed a lack of confidence in collectivity. People do not easily trust each other and they are reluctant to take responsibility. In addition, there is an aversion to meetings. As a result, organisation of farmers is only feasible when the benefits are clear and can be directly felt. It is also for this reason, that the water-users association in Krang does not function.

Women do go to meetings and participate, although not as easily as men. Clear and direct benefits for women, as for men, need to be defined when organising communities.

The falling away of subsidies, and rice prices which are determined by market mechanisms, will stimulate farmers to reconsider the importance of irrigation in relation to other income-generating activities. As women, especially those in poorer couple- and female-headed households, are involved in a greater range of income-generating activities, women will determine the household livelihood strategy.

The study results show that female-headed households are not disadvantaged per se and can be found throughout the strata of socio economic categories. The well-being of a female-headed household is determined by 1) the age of the female head, 2) the age/number ratio of the children; 3) the presence of married children and 4) the presence of close relatives.

Labour availability (whether female or male labour) is crucial for the well-being of a female-headed household.

Cambodia's rice farming is characterised by a farming system run by both wife and husband in which rice is the main crop and a few secondary crops may be grown.

The wet season rice varieties, whether irrigated or rainfed, are the most important ones to the farmers. A dry season crop is only attractive to those households which have the capital and labour necessary and can risk a crop failure. Although rain is perceived as the primary and most important water source, the villagers do not feel the necessity or responsibility for developing irrigation. "It is up to the sky", farmers say.

Ideologically there is a definite gender division of labour in Cambodian agriculture, but this cannot always be found in everyday life situations. Men are supposed to secure the family's needs but women are the main income earners. Women's labour is recognised but not valued accordingly.

The division of labour is characterised by certain tasks being carried out predominantly by either males or females. Where rice production is concerned both husband and wife are involved in the same processes, and tasks are sequential: male and female activities follow each other.

In general, irrigation activities are presumed to be male. This study questions this assumption, because women are just as involved, if not more, than men in field water management tasks. When it comes to system management, men play a far more prominent role.

The increase of male presence in the villages and the taking over by men of activities that women have carried out over the past decades (due to the absence of men) will determine the agricultural process in the future. With the increasing number of men in rural areas, women are quite happy to take a step back and let the men take over some of the work. This can only be perceived as a positive development.

As a result, the gender division of labour is becoming stricter and specific female activities (e.g. uprooting, transplanting, harvesting) are becoming gender neutral. This must be viewed with caution as men are also taking over water management. This might relieve women from hard and tedious work but simultaneously oust them from decision-making processes concerning the rice crop, as men are participating in all stages of production.

Although certain female activities are becoming gender neutral inside the household, they remain gendered outside the household. For example, men transplant their own household fields but the hired labour for transplanting remains female. This might be due to a general lack of male labour, but also the cultural value of presumed male labour is strongly adhered to.

Women are partially losing control over rice cultivation as their access to irrigation tools is hindered and their participation in irrigation on system level is reduced because they are discouraged from participating in decision-making processes. They have no formal decision-making positions, such as village leader or canal keeper.

Recommendations are given with respect to gender issues in 1) the changing agricultural production process, 2) the production of wet season rice versus dry season rice, 3) relation to the resources available, 4) community organisation, 5) the category of female-headed households and 6) education and research.

ACKNOWLEDGEMENTS

This study has been quite an adventure.

Without the support of many people it would not have resulted in this report.

Discussions with and comments from the Working Group members, SAWA staff as well as comments from NOVIB, have contributed to both the content and readability of this report.

Hanneke Meyers inspired us to start the research in the institutional setting of the Working Group and thanks to Mike Robberts who supported us to get the fieldwork on the rails.

We are grateful to the financiers who allowed us to work on this subject, especially NOVIB and PSO/CMC who guaranteed most of the funding.

The study team members Tep Srei Pov, Sdoeng Van Youthea, Botum Srei Neang, Tram Vutha and Em Khalavuth did a tremendous amount of work to gather all the data . Their patience and their insights were greatly appreciated. Thanks to Chanta no more time than absolutely necessary was wasted in travelling.

We would also like to thank the government staff at provincial and district level in Prey Veng and Takeo by allowing us to do the fieldwork and providing the necessary security. The information they gave about their area in addition to the points of discussion during the workshops stimulated the team to continue this project.

Most of all we are grateful to the women and men in the villages who allowed us to temporarily interfere in their lives and ask them some very personal questions. We admired their energy and sense of humour under the instable circumstances. We hope that somehow this report will contribute positively to their daily struggle.

Rhodante Ahlers
Sonja Vlaar
February 1995, Ede.



1. INTRODUCTION

1.1. Background and justification of the study

In the past decade, several Cambodian and international agencies have been working with communities, districts and government institutions to increase rice production. To achieve this, interventions to provide irrigation facilities were perceived as essential.

Very little is known of what the impact of such interventions is on the rural population and on family life in particular. A process of increasing gender awareness, and at the same time the lack of gender sensitive information about Cambodian rural communities, made several NGOs express their need to gain more insight into the gender relations in rural Cambodia. They specifically wanted to understand the ways in which gender relations structure, and are structured, as a result of irrigation development.

In 1993 the Working Group on Gender and Irrigation, an informal consortium of international NGOs based in Phnom Penh, formulated research questions for a Gender Issues in Irrigation study (GIIS). This report describes the results of this study, implemented in 1994 in two Cambodian provinces.

1.2. Institutional setting of the study

The Working Group on Gender and Irrigation (from now on referred to as "the Working group") has been born out of the Irrigation Sector Meeting of NGOs and governmental institutions active in irrigation activities.

The Working Group is an informal body, operational since august 1992, and composed of five international NGOs with representation in Cambodia:

- 1 American Friends Service Committee (AFSC)
- 2 Community Aid Abroad (CAA)
- 3 Cooperation Internationale pour le Developpement et la Solidarité (CIDSE)
- 4 Mennonite Central Committee (MCC)
- 5 OXFAM UK and Ireland.

The Working Group requested SAWA to implement the study. SAWA started the study with a formulation mission in December 1993 to finalize the Terms of Reference in agreement with the Working Group as well as the approach of the study, the area and interventions to be studied, the time schedule and the budget.

The study was funded by AFSC, CAA, CIDSE, LWS, MCC, NOVIB, OXFAM, PSO and SAWA. The members of the Working Group, NOVIB and several other persons contributed to the process of data analysis, the understanding of gender relations and contributed to the final results which are presented in this report. SAWA has final responsibility for this report.

1.3. Lay out and distribution of the report

The content of this report is, to a certain extent, the result of an interaction process between the researchers, the NGOs and the provincial/district government staff. The report has been written by the team leader Rhodante Ahlers (SAWA) and the backstopping consultant Sonja Vlaar (SAWA).

Due to the felt importance of the process of gender awareness in combination with information gathering, extensive attention is given to the methodology and institutional set up of the study. Chapters 1 and 2 present how and why the study was set up as well as its limitations. Chapter 3 deals with the methodology chosen to gather information with gender awareness as an active on going process.

Concepts on gender and irrigation are given in Chapter 4 which have structured the data gathering and analysis.

Chapter 5 gives the institutional context of NGO involvement in irrigation.

The results of the fieldwork are presented in chapter 6, 7 and 8 in which historic, irrigation and gender issues are discussed. Chapter 6 describes the impact of the social and political developments on the socio economic situation on national, village and household level. Chapter 7 describes the cultivation and irrigation practices studied while a gender analysis of the irrigated agricultural process is discussed in Chapter 8.

Chapter 9 draws these three topics together to identify the contemporary gender in irrigation issues for the two provinces studied and their practical implications. For each issue, recommendations are formulated on how these issues and their implications can be addressed.

This report is meant for all NGOs interested in gender and/or irrigation, governmental staff involved with gender and/or irrigation, donor-organizations of this study and other interested institutions and individuals. Copies of this report may be multiplied unrestrictedly with reference to the necessary sources. Original copies can also be provided by SAWA at reproduction costs.

2. OBJECTIVES OF THE STUDY

2.1. Objectives

The overall objectives of this study are:

- A To provide information - relevant to NGOs fieldwork - on the effects of the provision of irrigation facilities on gender relations at village-level, at household level and at intra-household level in Prey Veng and Takeo provinces. However, the objective is not to evaluate the intervention as such.
- B To provide information about a gender based division of labour allocation in rice farming households and the effects of project irrigation interventions on labour allocation.
- C To provide information about the position and decision making of women concerning farming and irrigation.
- D To provide insight into women's perception on irrigation development: what are their priorities and interests compared to those of men.
- E To provide recommendations to the Working Group on how specific gender-related issues in irrigation schemes can be addressed in future projects.
- F To promote gender awareness among the key persons involved in the study: the participating NGOs and their counterparts, as well as officials at district and provincial level and the study team.

Detailed research questions were formulated by the Working Group which are presented in annex 1 of this report.

2.2. Scope of the study

Although some irrigation-interventions of NGO projects have been studied, it has to be mentioned that this study is not a project evaluation. With reference to the project cycle, this study should be classified as an **assessment study on gender issues** in irrigation. The results can be useful in the formulation and appraisal phase of an (irrigation) project.

Although this study focuses on the gender relations in irrigation practices in rice farming, the study provides insight into the gender relations at the village level that can be useful for any rural development project in the study areas.

In order to obtain information relevant to NGO work, certain irrigation interventions and rice growing practices have been selected. The Working Group chose the provinces of **Prey Veng and Takeo** as several of the member NGOs are active in irrigation development in these provinces. Furthermore, different rice growing and irrigation developments can be observed in these provinces.

The NGO irrigation interventions studied are:

- rehabilitation of a gravity system in Prey Veng,
- rehabilitation of Pol Pot canals in Takeo.

The first deals with an irrigation intervention which necessitates collective social organisation for system maintenance and water distribution. The second intervention only involved organising villagers to rehabilitate the canals from which farmers could individually irrigate their fields. (see section 5.3.)

This study concerns itself solely with interventions on NGO-level and one which NGOs perceive as having potential at this point in time. For example, one they may implement or finance themselves. Irrigated pump schemes were not incorporated in the study as the Working Group no longer considers this intervention as viable. Several NGOs have withdrawn from irrigated pump schemes. The intervention could be implemented as a single activity (e.g. distribution of mobile pumps) or integrated into a larger project or programme. The direct result of the irrigation intervention itself can range from improving the water availability for rice production to organizing the community around water supply.

Given that the **rainfed wet season rice** crop covers roughly 80% of the rice cultivated area, it has a prominent place in the research. A recent development within rice growing practices show an increase in area cultivated by **flood recession rice**. This could be a transition from wet season floating rice to a flood recession crop in the dry season, as is taking place in Takeo province, or an extension of the area by means of farm level pumps (Takeo) or gravity irrigation systems (Prey Veng).

Other rice growing practices such as upland rice are not of immediate interest to the NGOs concerned and has not been included in this study.

Neither is irrigation for horticulture purposes as it did not take place in the study sites.

2.3. Limitations of the study

Clearly there are limitations inherent to this type of study. To mention the most important ones:

- 1) the time constraint (which directly impinges upon most of the following points);
- 2) gender issues in general are complex and dynamic. This complexity is reinforced by the lack of Cambodian data on gender issues and the transformation process Cambodia finds itself in;

- 3) the low level of qualification and experience of most of the Cambodian field workers, especially related to gender and agriculture; the gender dimension of many research methods only becomes explicit when the core members of the team have a conceptual understanding and skills to deal with gender issues;
- 4) striking an acceptable balance between "quick and dirty research" as opposed to thorough scientific approach which would take too much time to yield useful results for NGO policy makers;
- 5) the study focuses on households in villages and less on the institutional setting of the irrigation intervention;
- 6) the study covers the end of the dry season and the beginning of the wet season (April - September 1994). Therefore, some data may be seasonally biased;
- 7) the study involved only Prey Veng and Takeo provinces;

In addition to these limitations, a growing tension existed between on the one hand the process directed goals of the study and on the other hand the result directed goals. The process directed goals of the study were to bring about a process of gender awareness raising among the team members, staff of NGOs and governmental structures and villagers involved.

With the progress of the study, data analysis became more important and time consuming and was not always compatible with the gender awareness process. Irregular absence of team members unbalanced the team during the field work. Two team-members got married and a third one left the team during the second phase because of education opportunities abroad. Because of these life-highlights, and long term illnesses of individual team members, the working plan of the team had to be rearranged several times.

As there were no mine fields in the areas involved in the study, the hazard of mines is not discussed in this report. This is exceptional and not at all representative for the rest of Cambodia, where mines do structure the daily lives of the population.



3. METHODOLOGY

3.1. The study approach

3.1.1. A participatory approach

This study has been participatory from the start and could be characterized as a Participative Rural Appraisal (PRA) or Rapid Rural Appraisal (RRA). As PRA or RRA is usually not really 'rapid' and can also be applied in an urban context and because this study is essentially an assessment study, we prefer the simplified term Participatory Assessment (PA). PA concerns a **process** and a **set of methods** (or 'tools') for learning together with and from local people.

The process:

PA is based on a methodology directed towards allowing people to analyze their own situation. This means that not only the results but also the process of the study is important and both contribute to the goal of gaining insight into the gender relations in the project area.

As such, this study stimulated the study team, the Working Group, governmental development planners and villagers to work through questions, issues and future possibilities, to come to define their priorities. PA methods are useful as they can visualize and stimulate a discussion about the interpretation of reality.

For the study team, training workshops were organised on gender, irrigation and research methods before the fieldwork began and during the fieldwork.

The set of methods:

According to our view participatory research does not refer to a fixed set of methods, but certainly does exclude some. PA techniques can identify which axes are perceived as being more relevant to the issue of irrigation development and gender.

A selection of PA methods (given in par. 3.5) was made based on the discussion it would stimulate, the manageability of each method by the field workers and time restrictions.

Apart from these methods, the team organised workshops and seminars halfway through and at the end of the fieldwork in order to present study results and to stimulate discussion among, and have feed back from, representatives of the villagers, the NGOs, governmental staff, research institutes and interested individuals. Presentation of the study results was done visually (seasonal calendars, activity analysis, ranking) verbally and actively with participants.

3.1.2. Gender oriented

This study is not a sectoral (irrigation) study but deals with gender issues in irrigation.

The study uses gender as a focus. This does not mean that only the women are the subject of the study. This research studies the involvement of women and men within the process of irrigation.

Furthermore, the irrigation activities are studied in relation to other activities of women and men and to the socially or culturally established roles of women and men.

3.2. Composition of the study team

The field work has been implemented by a study team of six people:

- | | |
|-----------------------|---|
| 1 team leader: | a female Dutch irrigation engineer and researcher on gender and irrigation; |
| 1 research assistant: | a female Cambodian economist; |
| 4 surveyors | two male and two female Cambodian surveyors. |

The four surveyors were to be recruited by the NGO Australian Catholic Relief (ACR)¹, selected from an agricultural extension course developed by ACR. Unfortunately, ACR withdrew at the last moment and four people with no specific agricultural or gender experience were finally recruited by SAWA Cambodia. SAWA Cambodia furthermore provided logistic support while SAWA The Netherlands provided two backstopping missions by a gender expert.

3.3. Phases of the study

The study consisted of four phases:

- the preparatory phase (2 months)
- the first fieldwork phase (2,5 months)
- the second fieldwork phase (2 months)
- the data processing and reporting phase (4 months)

During the two months preparatory period (January - March 1994) literature was studied, the team members were recruited, logistics were prepared and the team was trained by the team leader.

The fieldwork was split into two phases. The first fieldwork phase (April - June 1994) was used to compile a reference base. The objective of this phase is to gain insight into gender issues concerning the development of rice growing practices where no irrigation intervention has taken place. Data were gathered in the two provinces where farmers grow rice in a traditional manner and where no interventions have occurred. Important traditional practices are rainfed wet season rice, wet season floating rice and flood recession rice during the early dry season.

For the second field phase (July - September 1994) the selected rice ecosystems are comparable to those studied in phase 1, with the difference that an irrigation intervention at system level has taken place, provoking changes in the farming calendar.

¹

ACR had at one time been a member of the Working Group before the study began.

In between the two phases provincial workshops were organised (June 1994) in order to involve local authorities, development planners and community workers in the study, to debrief the first results and gain additional insight from the participants.

In December two final workshops were organized to discuss the final results with farmers, local authorities, development planners and community workers. Comments and suggestions from the participants are incorporated into the final report.

3.4. Study sites

Table 1 gives an overview of the villages involved in the study.

Table 1. Overview of villages selected

Province	PREY VENG			TAKEO		
Village	Toap Sdach	Po Pluk	Krang	Samraong	Keo Kamplueng	Prey Sambuo
Field Phase	1	1	2	1	1	2
Rice Cropping Patterns ^a	-Rainfed -Early rainfed -Late wet season -Flood recession	-Rainfed -Late wet season -Floodrecession	-Rainfed -Early rainfed -Late wet season -Floodrecession	-Rainfed -Early rainfed -Floating rice	-Rainfed -Late wet season -Floating rice	-Rainfed -Early rainfed -Late wet season -Flood recession
Irrigation Source	ponds, reservoir	reservoir	reservoir, old Pol Pot canal	lake, Pol Pot canals	ponds	ponds, Pol Pot canals
Means	traditional tools	traditional tools, mobile pumps	traditional tools, mobile pumps	traditional tools, mobile pumps	traditional tools	traditional tools, mobile pumps
Intervention	-	-	rehabilitated gravity system	-	-	rehabilitated Pol Pot canals

^a For a detailed description of rice cropping patterns, refer to Chapter 7.1.

Annex 2 provides geographical maps with the selected villages indicated and annex 3 gives the selection criteria used.

3.5. Methods

Table 2 gives an overview of the methods used to gather information. The field phase, the number of respondents, or groups of respondents, per village and whether data are differentiated according to gender, is indicated for each method. Each method is briefly explained in annex 4.

Table 2. Methods used in the study

Method	Field Phase								Gender differentiated
		TS	PP	Kr	Sa	KK	PS	Total	
mapping (group)	1 and 2	3	3	3	3	3	3	18	yes
transect walks	1 and 2	2	2	1	1	1	1	8	no ^a
seasonal calendars (group)	1 and 2	3	3	2	2	2	2	14	yes
well-being ranking (group) ^c	1 and 2	3	3	4	4	3	4	21	no ^a
semi structured interviews	1 and 2	10	11	11	11	10	12	65	yes
Questionnaires ^d	1 and 2	50	31	46	29	37	46	239	yes
life stories and timelines	1 and 2	2	2	2	2	2	2	2	yes
venn diagrams	2	-	-	6	-	-	6	12	yes
key person interviews	1 and 2	3	2	5	2	3	4	19	no
daily timelines	2	-	-	29	-	-	34	63	yes
rice matrix (group)	1 and 2	1	1	1	1	1	1	6	no ^b

TS = Toap Sdach, Prey Veng

PP = Po Pluk, Prey Veng

Kr = Krang, Prey Veng

Sa = Samraong, Takeo

KK = Keo Kamplueng, Takeo

PS = Prey Sambuo, Takeo

^a For both the transect walks and the wealth ranking exercises extra care was taken that women were represented. In several cases we spoke only to women as there were no men available and vice versa. Participation of mixed groups was encouraged.

^b Rice matrices were done with women only as they select the seeds.

^c The households ranked by respondents were taken from census lists provided by the village leader. The maximum number of households ranked was determined during the field training days to be 60. Every third or fourth household was selected from the list.

^d The number of questionnaires were determined by having at least one fourth of the total number of households represented. Respondents of the questionnaires were randomly selected.

The above table of methods more or less follows the work schedule adhered to in every village. For the field phase 1 villages, roughly ten days were spent in each village. In the second field

phase, 20 days were spent in each village.

Daily discussions took place within the team to inform each other as well as to evaluate the suitability of methods and change where necessary. Halfway through the fieldwork of one village a first analysis was made by the team and again in preparation for the village meeting.

At the end of the fieldwork, the team held village meetings to present and discuss the findings.

4. ANALYTICAL FRAMEWORK AND CONCEPTS

4.1. Gender analysis

4.1.1. The concept of gender

The term "gender-blind" is generally used to refer to policies which appear neutral and refer to target groups as generic categories such as "communities", "the poor", the "farmers".

Many donor agencies propagate "women" as being an important project category, and an increasing number of agencies integrate the focus on women into their project policy. However, a focus on women does not mean a gender-bright policy and can even imply a gender blind approach.

The research deals with gender in irrigation and tries to understand the ways in which gender relations structure, and are structured, as a result of irrigation development.

This does not mean that only the women are the subject of the study. Gender is not "women".

Moreover, women, as a category within gender analysis, is not a homogeneous category.

Therefore, this research studies the involvement of women and men within the process of irrigation. Furthermore the irrigation activities are studied in relation to other activities of women and men and to the socially or culturally established roles of women and men.

Irrigation interventions and their opportunities can be better understood by using gender as a complementary parameter in social and economic analysis.

4.1.2. Units of analysis

For the fieldwork the following definition of **household** was used: a group of people which pools and distributes resources and whose members regularly share the same common kitchen and sleep regularly under the same roof.

Both the intra- as well as the inter-household relations need to be taken into consideration to understand social processes and their dynamics. Identification of the socio-economic situation of households or individuals represents a research-problem that had to be resolved with the target group. Instead of using terms such as the "better off" and "poorer", a socio-economic analysis of the household has to result in defining which households have more possibilities to reach their goals than others, why and its influence. The "rural poor" consist of different groups as a result of differences in class, caste, ethnicity, religion, age and sex.

A typology of households is of course an arbitrary question. More and more attempts are produced which give categories of household organisation to be able to target interventions. There may be strong practical reasons for targeting, for instance, female-headed households, but - however necessary this may seem to practitioners - classification in advance does not seem to

lead to a proper understanding of livelihood strategies of the various distinct households.

Aware of this debate among development planners, the study has focused on two different sets of data gathering:

1) a classification of households in three types:

- **de jure** female-headed households : these are households that are female-headed without any male support of a husband or partner throughout the year (widows/ divorced women / abandoned women / single women)
- **de facto** female-headed households : these are households that are headed by a woman, but receive some support from a husband or partner. The husband has migrated temporarily, but contributes financially or materially to the household)
- **couple**-headed households where both husband and wife run the household.

2) A PA socio-economic well being ranking exercise in each village in order to establish the relative position of households in the village and discover local criteria of socio-economic position and well being.

4.1.3. Tools of analysis

One of the guiding principles of the study is that it should reflect the views and perspectives of the rural women and men as the main subjects of the study. Their realities have to be discussed and understood.

This is why for example the survey includes a question asking who is considered as the head of the household and why he/she is considered as the head of the household. We did not want to designate the head of the household as it precludes a complete approach to gathering information about the rest of the household. Headship data in Cambodia have rarely been disaggregated by sex or age or marital status and generally there is a widespread evidence of male bias. In most cases surveyors assume who is to be nominated head and this leads to a bias in favour of male headship.

A framework developed by Feldstein and Poats (1989) is used as a tool to identify the different actors involved in agricultural production, their contribution and their gain.

Gender analysis focuses on three sets of questions:

* Who does what, when and where. This pertains to farm, as well as off-farm, non farm and household maintenance activities that compete for or complement farm production activities.

* Who has access to or control over resources for production. **Access** means the resource may be available, but without choice about timing or amount of use, or with some conditionalities attached. **Control**, means having decision making authority concerning a resource. For instance,

in many places women have access to ploughing services provided by their husband, but it is men who control whose fields get ploughed.

* Who benefits from each enterprise? What are the incentives for production? This depends on the responsibilities and priorities of the various household members and is determined by the access and control over resources. For example: irrigation interventions may bring changes in women's workload, without necessarily providing any direct benefits or serving their priorities.

4.2. Irrigation

4.2.1. The process of irrigation development

Irrigation technology can be defined as the knowledge and skills concerning irrigation consciously used by people to transform material and social reality. (Mollinga & Mooij, '89)

Irrigation technique is the hardware and its development can be understood as a process of social construction in which social and gender relations are involved. Irrigation water is a resource to which people have different access and which they use in different ways. (Bruins & Heymans, '93; White, '93)

Irrigation development, therefore, is the result of a process of negotiation. To unravel this process we need to define the actors involved and the relationships between them. (Artifakto, '90) Each actor uses her/his influence to make the result of this process as favourable as possible for her/his needs. By specifying gender differences, the participation of women in this process and the specific barriers they face in realizing their needs can be understood.

The outcome of the process of social construction determines to a large extent the management of it. Water management can be defined as the organized use of resources for the planning, operation and monitoring of tasks and activities related to the water distribution and use of irrigated agriculture. This includes maintenance, drainage, conflict control and cost recovery, as well as the organizational structures and communications. (Bruins & Heijmans, '93)

4.2.2. The definition of irrigation intervention

Interventions are possible results of the process described above. An irrigation intervention takes place when outsiders introduce changes to the irrigation technique or the water management. Outsiders are defined as those who are not a water user of the original system for so far it exists. An intervention can be an isolated or incidental activity, (distribution of mobile pumps) or be part of an irrigation project (rehabilitating canals, institutional development, etc). They can be implemented by governments, NGOs or other aid organisations.

4.2.3. User's characteristics

Another analytical instrument is the analysis of users' characteristics, to consider when designing an irrigation project (Edquist and Edquist, 1978). These characteristics are:

1. Interest: Men and women farmers have their own indigenous irrigation practices. Are men and women farmers interested, will they benefit from it, is it compatible with the old techniques;
2. Access to the technique: can men and women participate in using the new techniques. For example, do they have access to the necessary land or technical support or do norms and values inhibit the use, can they afford necessary inputs;
3. Possibility to implement the technique: are they in the position to (socially-economically-politically); can they provide the finances, can they be involved in decision-making, when involved are they listened to, etc;
4. Knowledge to work with the technology. Due to lack of formal education and a male bias in extension services, women are often not informed about new technologies. What do men and women know and which knowledge is lacking to design, operate, maintain and repair. Since knowledge about the design, construction, use, maintenance and repair of irrigation facilities is a precondition of control, extension should be directed to women as well.
5. The user's group should be able to organize itself to make decisions and make good use of the technique. Mechanisms have to be developed for a meaningful presence of men and women in this organisation of different socio-economic positions.

5. INSTITUTIONAL INVOLVEMENT OF NGOs

5.1. NGO involvement in irrigation development

Over a hundred international NGOs are active in Cambodia joined by a rapidly increasing number of local NGOs (about 90 in January 1994).

Until recently most of the international NGOs were involved in the implementation of emergency relief and rehabilitation projects, gradually changing now towards a more development oriented approach. NGOs which were involved with larger infra-structure development programmes or service-provision projects are now attempting to work directly with village communities. Given the new, more liberal political situation, there is a general tendency to loosen the links with public institutions as project partners, looking for private organisations as an alternative.

The international NGO community is rather high profile. The number of NGO expatriate personnel is extremely high in comparison to other countries. Several NGOs have during the last decade undertaken large operational programmes including the rehabilitation of irrigation schemes. There is a tendency towards a decreasing number of expatriates working with international NGOs in the coming years, in favour of an increasing number of Cambodians working for international NGOs (indigenisation of the NGO) and/or in favour of the strengthening of local NGOs. Most of the international NGOs have no operational plan that indicates their future relationship with the governmental organizations in general and DOH counterparts in particular in the near future. The government suffers an absence of sufficient and adequately trained irrigation engineers. Moreover, those irrigation engineers employed by the government are not fully utilized or are contracted by international agencies. The government irrigation institutions have insufficient capacity to coordinate and absorb the support offered by the many development agencies at all levels: NGO, bilateral and multilateral.

The Working Group consisted of members with different technical expertise. Three of the five international NGOs in the Working group have expatriate irrigation experts (one female). Of the other two NGOs, one has recently shifted the technical support from irrigation expertise (male) to a environmental expertise (female). One NGO was represented by a female Cambodian gender expert.

All of the expatriates work together with male Khmer counterparts stationed at the provincial hydrology departments. The NGOs have invested in the training of their DOH counterparts. Most of the DOH-counterparts have a supplementary (but substantial) salary from the partner- NGO in addition to their DOH-salary.

It is estimated that about 20 NGOs in Cambodia are actively involved in the irrigation sector in Cambodia. Basically they focus on rehabilitating the existing irrigation systems ranging from small schemes (50 -200 ha) to medium (200-500 ha).

In Prey Veng province the following NGOs are active in the irrigation sector: PADEK, GRET, HEKS and MCC. In Takeo: OXFAM, CAA, VSA and ACR.

All NGOs of the Working Group have been involved in the implementation of small and medium irrigation systems and in strengthening the DOH with training and technical assistance. Recently, NGOs have become involved in community development and promote water users groups. MCC has started pilot projects and designed a Farmer Participation in Irrigation Development programme for Prey Veng province to promote the involvement of farmers in all stages of development.

The shift of the overall goal of international NGOs, from emergency rehabilitation and relief oriented projects to development projects, implies that objectives, strategies, activities and means to realize the projects are also in a process of change.

5.2. NGO involvement in Gender

The lack of gender sensitive information on irrigated agricultural production, made the Working Group express the need to gain more insight into the gender issues in irrigation.

Sonnois ('90) and Ledgerwood ('92) did research on the situation of women in Cambodia, which provides useful information about women and their work and conditions of life. Research into the gender dimensions of poverty has been carried out by OXFAM (Mehta,'93), which makes a link between micro and macro issues from a gender point of view. Annex E, "Women and Development", of the final report for the Irrigation Rehabilitation Study in Cambodia (Halcrow, '94), provides specific information about gender and irrigation.

In order to analyze NGO involvement in gender issues, we can look at the different ways that gender is incorporated in the policy of the NGOs. We use the term "gender-blind" to refer to policies which appear neutral and refer to target groups as generic categories such as "communities", "the poor", "farmers". Practice has taught us that a gender-blind policy is implicitly male-biased.

Not all gender-aware institutional policies share the same views and strategies to improve the situation of both women and men.

Greater gender awareness may lead to three alternative approaches to policy (Kabeer,'92):

- * Gender neutral policies. They rely on accurate sex-differentiated information, in order to ensure that policy objectives are met in the most efficient way possible. Gender neutral policies however, leave the existing division of resources and responsibilities intact.
- * Gender specific policies. Advocacy on behalf of women and recognition of past neglect of women's gender related needs has given rise to policies which favour targeting on women. However, without special attention for transformative activities, these policies are likely to leave the existing division of resources and responsibilities intact.
- * Gender redistributive/transformative policies. These seek to transform existing gender relations in a more democratic direction by redistributing more evenly the division of resources, responsibilities and power between women and men.

As briefly mentioned before, the NGOs find themselves in a transitional period during which overall goals are changing from relief/rehabilitation directed aid towards community development and structural aid. The discussion on gender issues has a far more prominent place in structural development in comparison with emergency relief, stimulating NGOs to take up this discourse.

Recently the policy discourses and differences between the Women in Development (WID) approach and Gender and Development (GAD) are being discussed in the Cambodian NGO-network. These discussions help to discuss and understand different development strategies and the targeting of projects.

Donor agencies are stimulating attention for gender issues by rewarding quantifiable action and conceptual accountability.

Gender issues are thus becoming integrated into the NGO policies. Policy statements of most NGOs have not yet been operationalized. There is still a wide gap between theory and practice. During this study, the team did not see any engendered project activity during their field work.

This can be explained by the fact that NGOs have not decided upon the strategy for implementation. In order to elaborate this strategy, the NGOs first of all need base line information about gender relations of their target groups. Needs-identification studies will have to shed some light on the type of transformation that both women and men in the villages would like to see realized. It is also for this reason that the NGOs took the initiative for the present study about gender in irrigation.

5.3. NGO intervention in the study area

The Working Group chose two irrigation interventions which are both managed by NGOs but very different in their approach.

Firstly, the MCC project is based on farmer participation as a means towards sustainable development, implying an institutional framework to organise and communicate with and amongst farmers involved in an irrigation scheme. The Oxfam intervention is limited to consultation with certain farmers before construction and organisation of labour during construction with as final result the physical rehabilitation of two canals.

Secondly, MCC rehabilitated a gravity irrigation scheme necessitating the organisation of the water distribution and repair and maintenance of the system. Oxfam rehabilitated two canals, more or less gravity fed by another canal (canal 15), from which farmers can, in theory, extract water individually by gravity and mobile pumps.

Thirdly, the MCC project deals with several hundred hectares over 3 sites while Oxfam is covers with several thousand hectares with 5 to 10 projects per year.

A short description of each intervention follows. It was not the objective of the study to compare or evaluate these interventions but to understand how women and men work with, and benefit from them. Furthermore, both MCC and Oxfam are in a transition towards community development in

which irrigation is only one of the activities. Both projects involved in the study were implemented before this transition took shape.

5.3.1. Farmer Participation in Irrigation development; MCC Prey Veng Irrigation project.

Prey Veng is located in south eastern Cambodia. About 92% of the cultivated land grows a wet season crop which is generally completed without irrigation and is dependent on the irregular rains. Prey Veng produces about 200,000 ha of rice at fairly low yields (1.5 -2.5 tonnes/ha). Dry season rice is grown on about 13% of the cultivated land area and requires irrigation.

MCC operates its own programme in Cambodia since 1981. It conducts community development, peace making and relief programmes out of a Christian commitment.

Since 1989, MCC has had a program of assistance to the Prey Veng Hydrology Bureau (PVHB), the government agency responsible for irrigation development in the province.

As the benefits realised were far from meeting expectations, MCC deduced that a major part of the problem was the lack of farmer involvement in the design, operation and maintenance of the projects. Based on models developed in other South East Asian countries, a program was designed involving full time field based staff (community organisers) to facilitate the farmer participation process. In Prey Veng six Community Organisers were placed in the project to act as catalysts for farmer participation in the planning, construction and eventual operation and maintenance of the irrigation systems.

The program includes rehabilitation and expansion of three pilot projects with a combined irrigated area of approximately 330 ha. All three pilot projects are dry season recession rice systems: wet season flood water is trapped behind a dam; rice crops are planted below the dam as the flood waters recede; water flows by gravity from the reservoir to irrigate the crops.

One of the goals of MCC is to de-emphasize capital investment and emphasize social investment in the irrigation system. MCC's financial contribution to rehabilitation at each project has been limited to \$US 5000. Farmers at each project are expected to contribute an additional 10% to the project costs in manual labour, construction materials and/or land right-of-ways. World Food Programme provided rice for manual labour in earth moving and construction tasks (food-for-work).

The pilot project involved in the study is Kampong Sne East which lies east of the Kampong Sne dam tapping water from Boeng Pring reservoir. See annex 2 for the geographical map of the system with the villages involved in the study. Table 3 gives an overview of relevant project data.

Objective of this project is to increase the area for dry season flood recession crop by improving and facilitating water availability through gravity flow.

5.3.2. OXFAM KAM 215 Irrigation Programme, Takeo Province.

Takeo is situated in the south of Cambodia bordering with Vietnam on the east. On the vast plains in Takeo, flooded annually, a floating rice crop is grown with very meagre yields (0,5 - 1,0 tonnes/ha). A wet season rainfed crop is grown on higher land. The wet season floating rice has over the years been making way for an early dry season flood recession rice through water control by means of dams, reservoirs and floodplain canals. Another prominent feature of Takeo is its dense canal network dug during the Khmer Rouge regime.

Oxfam UK and Ireland has been working in Cambodia since 1979, moving from emergency relief to reconstruction, rehabilitation and development work.

Oxfam has been engaged in irrigation activities in Takeo since the early 1980's. In 1990, the Takeo Irrigation Structures Project (KAM 215) was initiated. Although the objectives change over time and are still changing, the evaluation report (1993), identifies three common aspects: training activities, construction of irrigation structures and stimulating farmer participation in operation and maintenance of irrigation structures. Beneficiaries of these objectives are government staff at provincial and district level and the villagers involved in the irrigation works.

Oxfam in Takeo has a strong focus on the Provincial Office of Hydrology and supplements the salary of counterpart staff. Training inland and abroad are organised for the hydrology staff. With the exception of a specific community development programme in Koh Andet, villagers generally benefit as a result of construction work.

Oxfam has a large range of construction activities involving the rehabilitation of so called Pol Pot canals as well as the rehabilitation or new construction of hydraulic structures in embankments or irrigation systems. Between 5 to 10 projects are realized yearly covering several thousand hectares.²

Oxfam provides its own finances which is organised on a yearly basis without financial demand from villagers. Villagers are asked to provide labour on constructions in return for rice, oil and fish, as part of the food-for-work programme. Recently, this has changed to a cash-for-work arrangement.

The projects involved in the study were the rehabilitation of canals 94 and 95.

Objective of the projects was to provide a secure water source for the farmers to grow their rice crop.

2

In total Oxfam's projects in Takeo cover roughly 10000 ha.

Table 3 Overview of project data for the two interventions studied.

Project	MCC Prey Veng	Oxfam Takeo
Irrigated area (ha)	83	500 ^a
Potential area (ha)	400	500
Affected families	340	700 - 1000
Crop affected	dry season floodrecession rice	dry season floodrecession rice
Project works	repair canal; add canals, checks and turnouts; community organisation	remodelling canals

^a The figures for Takeo are estimates derived from the evaluation report: Takeo Irrigation Structures, Cambodia, 1993.

6. SOCIO-ECONOMIC SITUATION

6.1. National level

Cambodia's agriculture has been through three major transitions in the last twenty years. The first transition was the Khmer Rouge reorganisation of society into a pure agricultural society and the second was the reorganisation following 1979. The transition in which the rural population, and really all of Cambodia for that matter, finds itself now is that from centralized state control to privatization and decentralisation. All three had their impact on the socio-economic situation of the communities at village and household level. (See Annex 5 for a historic time line)

The birth of the Democratic Republic Kampuchea brought a national reorganisation. The state became the de facto guardian of the Cambodians, challenging the traditional age hierarchy and extended kinship system (Halcrow, '94). Towns were depopulated, people were moved around the country and many children were separated from their parents who were either killed, moved elsewhere or had died from hardship.

When the Heng Samrin government, backed by the Vietnamese, came into power in 1979, it introduced a less rigorous form of rural collectivization than the Pol Pot era had known. Agriculture became organised in *Krom Samakis*, meaning "solidarity groups". The groups usually consisted of 10 -15 households. Three types or levels of krom organisation existed:

1. The krom collectively manages all lands, share labour, animals and farm equipment. The produce is divided among the labourers according to age and capacity to work.
2. The land is divided among the households in the kroms but collectively cultivated. The produce grown on the households allotted fields, goes to that household;
3. All means of production are privately managed by the households. The kroms function as labour pools for exchange labour. (Fujisaka, Boua & Kiernan, Sonnois)

Each village studied went through a different krom samaki process. In some of the villages land was divided up as early as 1981 and most villages had abandoned the krom samaki system by 1986. A few villages still make use of the kroms as they existed under type 3.

The reason that villagers most frequently gave for breaking up the kroms was that others profited from their labour. Some villagers told that they were fed up with not being able to take decisions, others say that they could not make their own money. Some households would agree it was beneficial to those households with labour shortage (Female-headed households, soldier families, households with illness or handicaps).

Instead of the krom samakis, farmers revitalized the system of *krom prowas dey*, a labour exchange system. All non-land assets were sold or divided among the group and generally those who could recognise their draught-animals claimed them back.

In 1989, agricultural reforms took place changing land tenure policies and the organisation of production at farm level, as well as the introduction of pricing, taxation and marketing. The state

disengaged itself from production activities, subsidies were reduced and state enterprises were privatized.

By formalizing private landownership, the family became the primary unit of production. The land division or reform redistributed land in a fairly equitable fashion. Unfortunately, it is therefore used by villagers as an argument for their lack of social concern for vulnerable households. Often heard statements are:

poorer households were given the same amount of land as we were, so it is their problem if they cannot cope.

Poorer households should not be given more possibilities for improving their economic situation as they did not take good care of their land.

Some will acknowledge that a few households were unlucky but most are adamant in their lack of empathy.

With the falling away of subsidies, households were confronted with the costs of fertilizer, pesticides and insecticides. This privatization had its impact on social differentiation as families with sufficient humanpower and capital could exploit the new possibilities whereas it has put a greater strain on vulnerable households. (Sonnois,'92)

Women, the continuous factor in these developments due to lack of males, have had to cope with these transitions as well as they could. They were responsible for keeping the agricultural process going while the country was recovering from the years of Pol Pot, while the war was raging, while political developments changed rural possibilities. Even though these women constitute a group with varying possibilities in different socio-economic situations, together they were the economic backbone of the country for the past 15 years.

In the recently adopted constitution of the Royal Kingdom of Cambodia women are said to be equal to men and have equal opportunities and enumeration. Unfortunately, there are, as yet, no mechanisms to enforce this principle of equality. Furthermore, cultural interpretation of male and female identity are such that even though women are respected for what they ought to do, they are restricted in what they want to do. Women are respected as mothers and nurturers of the family, and their status increases if they show proper behaviour and are married at a reasonable age. Men, in comparison, should be strong and work hard and provide the household with its material needs. (Sonnois, Ledgerwood, Tarr)

Women have less access to education, women are hindered in their mobility, women have no access to positions ideologically defined as male and women's work is still not fully recognised as determinative for Cambodia's economy.

6.2. Village level

General

The six villages involved in the study cannot simply be compared. They are in two very geographically and historically different provinces resulting in their own specific development. Nor can the villages with and without irrigation intervention be compared as a before-and-after situation as the intervention is not an isolated factor of influence. However, differences and similarities can be presented aligned to the factors that have led to them. In Annex 6 a description of the contemporary situation of each village is given and annex 2 its geographic position.

Table 4 gives the demographic data for each village. The figures given in the table are those available at village or district level either due to a census count or estimates made on the spot. The table shows that the percentage of female-headed households remains high as are the percentage of women compared to men in the labour force. While the population imbalance of men and women is decreasing in Cambodia, this imbalance is still present where the labour force is concerned. This will continue to be so for several years seeing the high percentage of children. In Samraong and Prey Sambuo, we were confronted with a large number of women abandoned by their husband. These women choose to live with their sisters or mothers. This makes the figure of female-headed households lower than there are actually female heads of households.

Even though rice production is the main activity and priority of the rural population, it is an insufficient income source. Shortage of land, limited land quality, difficult water regimes, labour shortage and uncertain pricing are only a few of the reasons given by respondents. In combination with the falling away of subsidies for agricultural input, households are forced to supplement their income by other activities.

In two of the villages (Toap Sdach and Krang), migration labour had become nearly as important as rice cultivation. In Keo Kamplueng and Samraong villagers were breeding oxen and ducks as well as marketing vegetables, fruit and fish to generate a cash income. Where rice production is sufficient for the community as for example in Prey Sambuo, it is sold to rice traders and thus introducing cash into the community.

As a result, the cash economy and access to it is becoming increasingly important. Rice no longer structures the rural economy.

Organisation in the villages

All the villages have male village leaders appointed by the district officials. The involvement of villagers in choosing their leaders varies between villages. In Toap Sdach, for example, the district and commune decide on the candidates from whom the villagers finally choose. There have never been any female candidates. In Keo Kamplueng the district appointed the village leader after consultation with the villagers. The villagers did not want to choose their own leader. They said they would feel no responsibility for having made a certain community choice.

we need somebody from higher up to tell us what to do (group discussion)

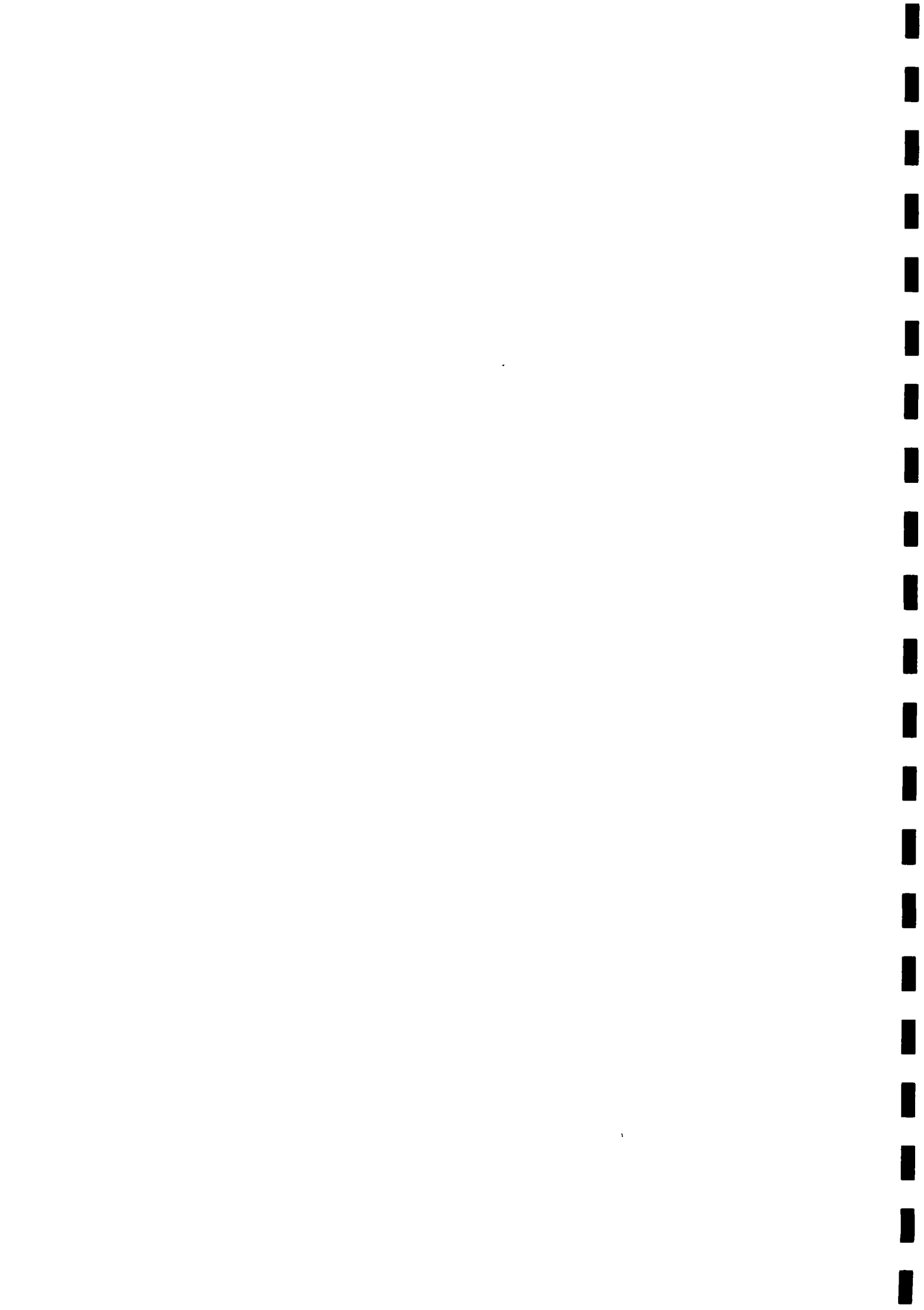
The village leader is the link between the village and commune and district, whose orders he has to communicate to the villagers. Usually, the village leaders invites household heads for meetings or instead visits every household. In practise, the households further away or not well known to village leader are sometimes forgotten. As the hierarchy is strongly felt, village leaders have quite a powerful position. Development aid is usually organised through the village leader, strengthening his position further. Quite a few village leaders were able to benefit during the land division and several divided common property amongst friends and family.

In all the villages, the village leader was fairly popular and respected. The only exception was Po Pluk where the village leader's position seem to be undermined by the representative of UNICEF's family food programme and the elderly monks of the Po Pluk Wat.

o eng	Prey Sambuo
43%	(528) ^e (56%)
57%	(491) (44%)
100%	(947) (100%)
56%	(441) ^d (46%)
21%	173 77% 52 23% ^f
100%	171 ^e /225 ^f
55%	?
45%	?
34%	?
	30
	141
ha are lains with)	Unlike other village dry season is the main crop selling of rice is the major income source, in contrast with other villages
is cut is and nate by the only ansport	Rehabilitation of so called Pol Pot canals

ey Sambuo, figures are for under

9 of female headed households



The Wat is an important institution in the village. A Wat keeper is voted by the monks and the elderly and is responsible for keeping the financial accounts and running the daily activities related to the Wat. The poor help out in the Wat complex by cooking, cleaning or working in the fields and in return are given meals. Poor families can send their sons to work and study at the Wat. The elderly, especially women, go to the wat to pray or socialize. Villagers contribute rice to the Wat. The monks can be instrumental in organising community activities such as gathering money to construct roads and schools. The organisational strength of the monks vary between villages. In Po Pluk and Keo Kamplueng it was particularly strong, while in Toap Sdach and Prey Sambuo hardly existent. District and commune authorities regularly approach monks to organise the community for government activities.

The exception to the above is Samraong. Samraong is a Muslim, or Cham, village. The religious institution is complementary to, and together with, the village leadership an important decision-making power. Villagers are obliged to yearly contribute a certain amount of rice to the mosque. The mosque also serves as a school where khmer classes are given in the morning and arabic classes in the afternoon.

Being a minority group and discriminated as such in Cambodia, the social structure of the village is very tight. The team members were surprised by the solidarity they encountered among the villagers in Samraong. The Cham are daily discriminated against outside their village and were dispersed and threatened during the Khmer Rouge era.

Samraong had specific features compared to other villages. The nonexistence of borrowing with interest, explained as not being allowed by the Koran, is an example. Another feature encountered was that women seemed more restricted in decision-making processes. Women in couple-headed households were never regarded as the head of the household and in only 3 cases regarded as joint head. Women were not expected to attend meetings except if they were widows, single or divorced.

However, they do have more access to education and are just as involved in earning money or agrarian labour as women are in other villagers.

The villagers in Krang are water users of the partially rehabilitated Kampong Sne gravity system. They are officially organised in a *samakum*, which can be translated as "irrigation association". Not all the households of Krang are member of the samakum nor do all its members go to the meetings.

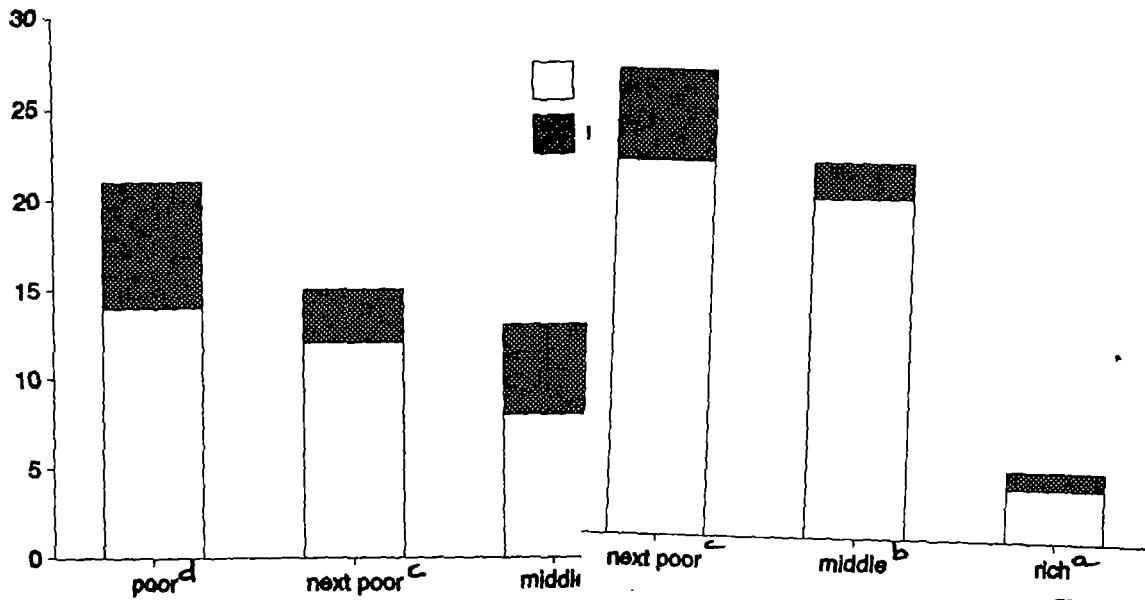
6.3. Household level

The criteria which determine the socio-economic position of an household vary between villages. Figure 1 shows the distribution of households in socio-economic groups for each village with the characteristics of each group.



Figure 1: Distribution of households in

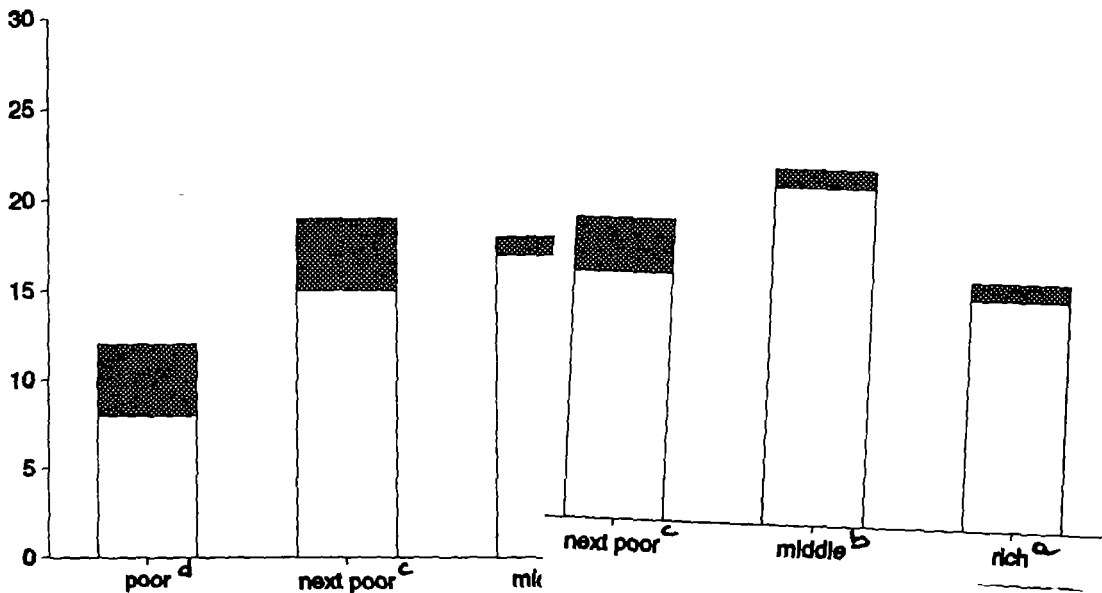
Nr Households



Toap Sdach

- a Resources accumulated before 1975 (gold, palm tr business ventures, gov salaries supplementing rice business ventures.
- b Draft animals; abundant labour; cash generation (rice (3 yields), small business, rice produce
- c Priority with rice cultivation, lack of draft animals; deficient in rice, lack of land, small children, migration flow
- d Small landholding, lack of draft animals and rice produce (1-3 mths/yr), lack of cash sources, do not have season land.

Nr Households



SAMPAONG

- a Emphasis on business (oxen, ducks) instead of rice; large landholdings, several pairs of draft animals,
- b Large landholdings, duckbreeding, surplus rice produce; several pairs of draft animals; rice surplus; on farm equipment.
- c Lack of draft animals, labour and rice produce; small and labour but uncertain on farm income sources; lack children. (6-11 months).
- d Lack of labour and land; no draft animals; household split into two children. needs with cash but no land, lack of rice produce (6-11 months); temporary debt. no land, no relatives for support, permanent debt

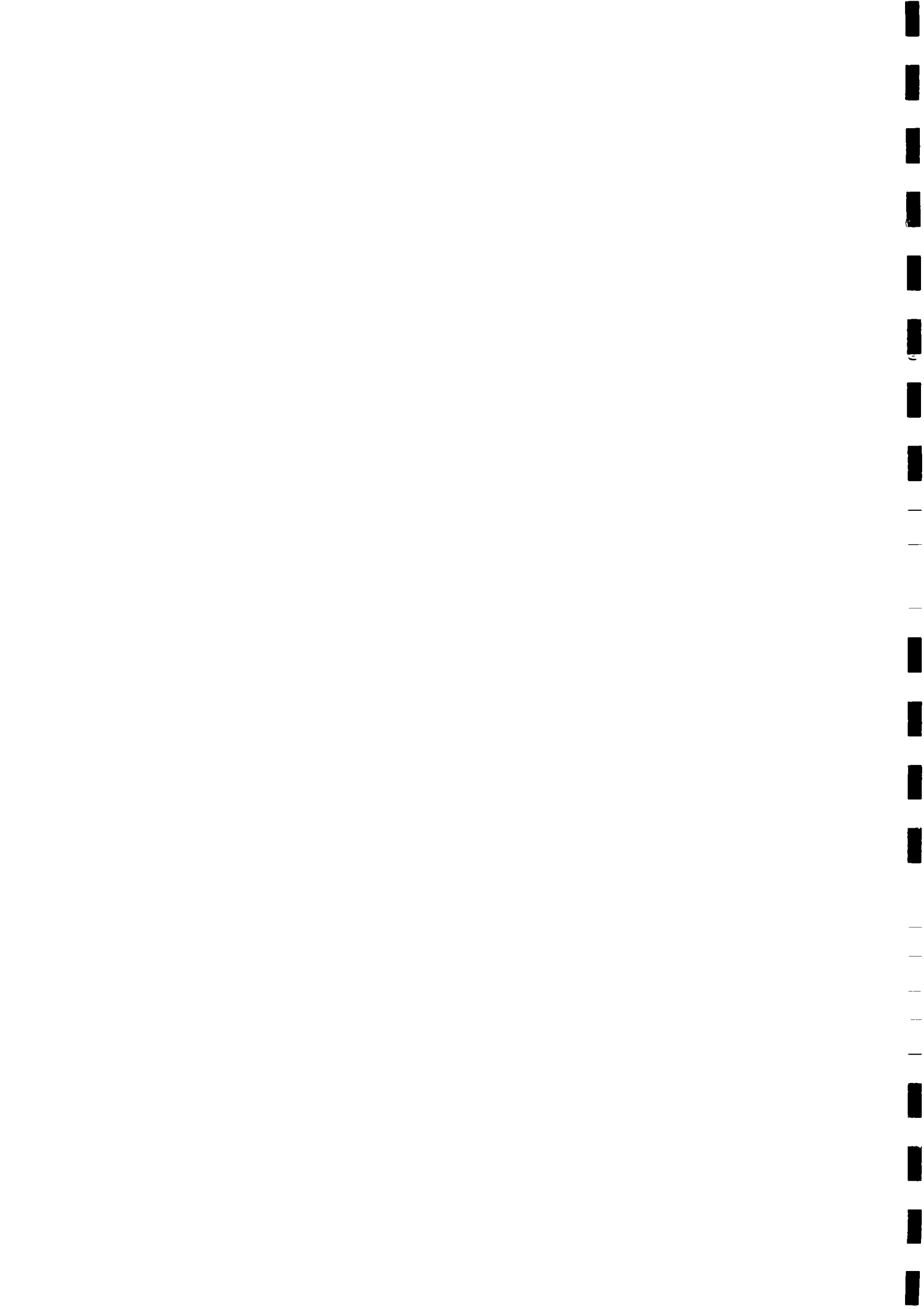
As mentioned before, the cash economy is of increasing importance and rice cultivation does not provide sufficient income to sustain the household. In all the villages, wealthier households had been able to jump into this development by investing their assets such as gold or rice stock in small business ventures. Gold from before the Pol Pot era, family connections in Phnom Penh or abroad and government salaries contributed to the possibilities these households have. These sources of capital were determinative in a society where the means of production were largely shared by all members of the community.

Since the means of production are privatized, social differentiation has accelerated. In each village this has developed differently. However, the access to the resources land, labour and draught-animals and especially their interaction define the boundaries of social differentiation. An unfortunate combination can lead households into hopeless debt relations. How these resources interact is discussed in section 8.3.

Illness and physical handicaps are common financial drains for households. Costs for medicines are extremely high, government health services are often inaccessible and private clinics have exorbitantly high rates. Many households become destitute as a result of the costs of illness or handicaps in the family in combination with the lack of labour it results in.

This is the case for both the intervention and non-intervention villages. In the villages where irrigation interventions have taken place, rice production has increased but does not benefit all households equally. Especially those households with enough capital and labour can profit from the improved water accessibility.

As water is not scarce, or rice production commercially attractive, water as a resource contributes to socio-economic differentiation but does not determine it.



7. RICE CROPPING PATTERNS AND RELATED IRRIGATION PRACTICES

7.1. Overview of rice growing practices

The importance of the rice crop to farmers cannot be underestimated. It is their priority, and often their only crop. Farmers are only interested in other crops if self sufficient in rice. By farmers both male and female farmers are meant.

Annex 7 gives the area and production figures for rice cultivation in Cambodia. Before 1970, 2.5 million ha were cultivated with rice, in 1986 this was 1.6 million ha. Today an estimated 1.8 million ha are under rice cultivation. The decrease in cultivated area is partly due to the drastic reorganisation of society during the Khmer Rouge period.

Farming households were ripped apart, taken off their farms and put to labour which many did not survive. Thus, farmers lost their knowledge of their particular ecosystem and were unable to further their knowledge due to not having any influence on the production process. One could speak of an erosion of knowledge during this period. One exception which women in Takeo told us, is that they had learned how to transplant during this period.

Eliminating the cultivation of low yielding traditional varieties and intensifying production were two of the major goals of the Khmer Rouge agricultural policy. Many traditional rice varieties were lost and the surviving generation was left without the intricate experience on soil and water management. (Fujisaka, Langdo & Solieng, Boua & Kiernan, Halcrow)

Other major constraints are the instability of several provinces where fighting results in large numbers of internally displaced peoples; the large area of land still containing mine fields; farm labour shortage as approximately 50% of the population is under 15 years of age. (Halcrow, '94) This in combination with factors such as erratic climatic conditions (irregular rainfall and excessive flooding) and poor soils make rice cultivation tricky.

The study observed areas where lowland rice is cultivated. Lowland rice cultivation accounts for 1.6 million ha and knows more than 3000 different varieties grown on roughly three levels. Although ricelands are level or nearly level one can distinguish higher, middle and lower fields. The higher fields generally have sandy soils, shallow water levels and are subject to periods of drought. Usually, early maturing varieties which have some drought tolerance or medium maturity varieties are planted in these fields. The middle fields have sandy, sandy loamy soils, medium water levels on which medium maturity varieties are grown which have less tolerance for drought or deep standing water, but are most favoured for their eating quality. The lower fields have sandy loam soils with some silt content, a deeper water level and late varieties are sown. (Lando & Solieng,a)

Figure 2. Cross section lowland wet season rice

Land:	Higher	Middle	Lower
Soil:	sandy	sandy, sandy loam	sandy loam silt
Water depth:	0-15 cm	10-30 cm	30-80 cm
Crop type:	Early maturing 120-165 dys	medium maturing 150-180 days	late maturing 170-210 days

Source: Adapted from Fujisaka, 1988 and Lando & Solieng, a.

Another typical cultivation is floating rice. This crop is found in areas flooded by the seasonal overflow of the Mekong and Tonle Bassac rivers. The low yields and the disruptions of the Pol Pot era have decreased its area. In parts of the country, farmers were forbidden to cultivate floating rice and in an attempt to convert floating rice areas to an irrigated dry season culture, farmers were forced to excavate and construct elaborate water works. (Lando & Solieng, b)

Not only the Khmer Rouge thought that the dry season rice crop would boost Cambodia's rice production. Both government and NGOs have focused and are in part still focusing on the expansion of irrigation facilities to develop dry season rice cropping using modern, short term high yielding varieties. Two distinct types can be distinguished in relation to water management. The first is transplanting the rice along with the receding flood water. The second is cultivating a fully irrigated rice crop. Usually dry season fields lie further away from the village and are inundated during the wet season. (Lando & Solieng, c)

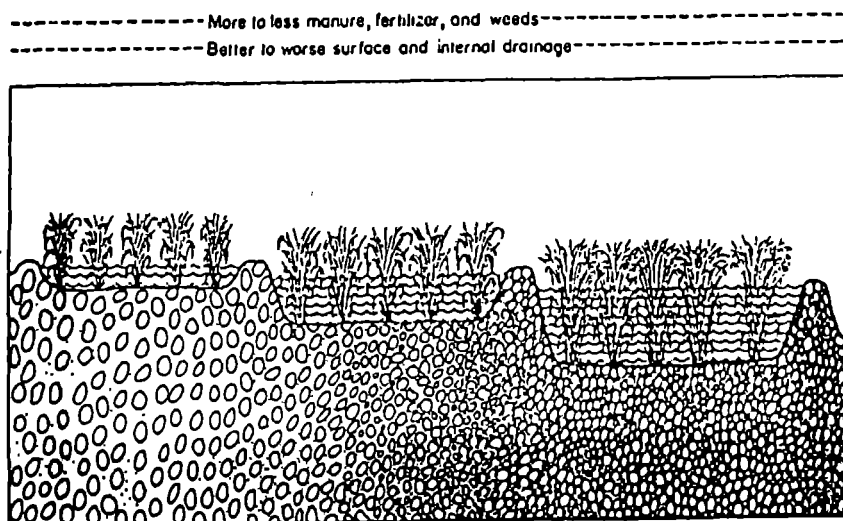
In section 7.2 the 5 rice cropping patterns and their related water management are explained. Subsequently, an historic overview of irrigation practises is presented in 7.3 and actual water management per rice cropping pattern in 7.4. In section 7.5, special attention is given to the villages where interventions have improved the irrigation possibilities.

7.2. Classification of rice cropping patterns

The following classification of rice cropping patterns has been defined for this study. Upland rice cultivation is not mentioned as it was not practised in any of the villages taking part in the study.

1. Rainfed Lowland Rice.
The most common transplanted rice crop grown from June to January (on high and medium fields). Average yields are between 1.5 to 2 tonnes/ha.
 - 1A. Total rainfed dependent
 - 1B. Rainfall with supplementary irrigation
2. Early Rainfed Lowland Rice.
Short duration transplanted rice crop, usually high yielding varieties grown from May to August. Average yields reach 2 to 2.5 tonnes/ha, cultivated on the same fields as 1A/B.
 - 2A. Total rainfed dependent
 - 2B. Rainfall with supplementary irrigation
3. Late Wet Season Recession Rice. (Chomlok)
A common transplanted rice crop cultivated on the lower fields and grown from November to February. Average yields are between 2.5 to 3 tonnes/ha.
 - 3A. Total rainfed dependent
 - 3B. Rainfall with supplementary irrigation
4. Flood Recession Rice - Dry Season.
Short duration transplanted rice crop, usually high yielding varieties and grown from February to April. Yields can range from 1 to 5 tonnes/ha.
-always with supplementary irrigation
5. Floating Rice.
A broadcasted wet season rice crop cultivated in low lying, annually flooded plains and grown from July until December. Average yields vary between 0.3 to 0.9 tonnes/ha.

Figure: Cross section lowland wet season rice



7.3. Historic overview of irrigation practices

Than (1982) gives a clear overview of what he has defined as the 5 distinct periods of irrigation development in Cambodia. In short it comes down to a rich history of irrigated agriculture in which Cambodians have developed ways to combine certain cropping patterns with methods to manage the floodwaters. A brief summary³ of Cambodia's history is presented in table 5. While categorizing periods, one needs to remember that throughout history farmers have continued irrigating in their own way, characterised by very little collective organisation but on the basis of incidental cooperation between households.

Up to the Khmer Rouge period, Angkorian reservoirs had been remodelled by the French, canals had been rehabilitated, gravity systems developed, dams built to hold back receding water and traditional schemes upgraded. In this period a system was developed where dikes and sluices are used to control annual inundations (colmatage system). In 1957 the Mekong Committee was founded with Cambodia, Thailand, Vietnam and Laos as member states. During the Khmer Rouge period super irrigation schemes based on the Angkor Wat system were built. Canals were dug in a chess board pattern along grid lines and big dams were constructed. The Khmer Rouge gave up Cambodia's membership of the Mekong Committee in 1975. The result of the chess board digging was an enormous loss of lives and a negative environmental impact on floodplain management.⁴

Constructions since 1980 have not fared better. Pumping schemes have given new impulse to grow a dry season crop but have in recent years been abandoned by NGOs for being unsustainable.

3 *References for a detailed overview: S. Than, '82; B. Pijpers, '89 and A.M v.d. Linden, '89)*

4 *Annex F of the Irrigation Rehabilitation Study of Cambodia, Halcrow e.a, 1994 gives more detailed information on these effects.*

Table 5. Chronological overview of irrigation developments this century

Period	Activities
Before '57	French colonial period: - remodelling Angkorian reservoirs; - rehabilitation of canals - gravity systems - upgrading traditional schemes - colmatage system to control annual inundations
1957-1975	-Founding of Mekong Committee -plans for hydraulic energy dams
1975-1979	Khmer Rouge. -super irrigation schemes based on Angkor Wat system -chessboard of canals along grid lines -construction of dams to hold water for the dry season
1979-1989	-pumping schemes -rehabilitation canals -distribution pumps
1989-	-abandonment of pumping schemes -moving slowly towards more farmer managed irrigation development

The trend today is to investigate the possibilities of farmer managed irrigation development. Even though the government still strongly focuses on the development of larger scale irrigation schemes to boost rice production, NGOs have taken a step back in construction and implementation activities to instead stimulate farmers involvement in irrigation perspectives.

7.4. Actual water management and irrigation practices

The watermanagement and irrigation practices are discussed for each cropping pattern. Table 1 in par 3.4 gave an overview of cropping patterns per village. In general irrigation is neither strategically planned at household level or at community level but occur on an adhoc basis. Everybody interviewed said:

it is up to the sky

This means on the one hand that rain is perceived as their primary and most important water source. On the other, the necessity or responsibility for developing irrigation is not felt.

7.4.1. Rainfed Lowland rice (1A and B)

In all the villages cropping pattern 1 is cultivated. In Samraong and Keo Kamplueng in Takeo (phase 1) transplanting was a new activity. Samraong started transplanting in 1992. Villagers heard from friends and relatives in other villages that higher yields could be gained by making

seedbeds and transplanting the seeds.

In Keo Kamplueng, transplanting was done for the first time in 1994. Due to the early heavy rains the fields were too wet to broadcast but would be very suitable for transplanting. People in Keo Kamplueng preferred broadcasting as it is far less labour intensive. Especially the women complained as men will broadcast but will not help them transplant. On the other hand, it does allow women to be more involved in agricultural production.

In both villages the women had learned how to transplant during the Khmer Rouge era. They exchanged rice for seeds of varieties more suitable for transplanting.

The water management for this cropping pattern is concentrated on the seedbed. When the rains begin the fields are cleared and ploughed. The seedbeds are made and sown. The water level is carefully monitored to drain or irrigate when necessary. In the beds a drain is ploughed round the bed and one crossing the bed to control the water level. If necessary water is added to the field by using *yongs*⁵ or *snachs*⁶.

During land preparation before transplanting the field needs to be well inundated. After the crop is transplanted, the field water level is checked regularly. If necessary the field is drained into the field below it or irrigated by draining the field above it.

Neighbouring field owners often work together and discuss their crop. *Snachs* are lent to the field neighbour. The owners discuss the water-level in the field and when and where to open the bunds. One would imagine conflicts arising when a farmer needs more water due to lack of rain and opens her neighbour's field while the neighbour would seem to have the same trouble. Farmers informed that there are no disputes, what could not be checked and is found difficult to believe.

The intensity of water management differs per village. In several villages the women tell us that they go to the fields every day (Po Pluk, Toap Sdach, Samraong), in others they go once in a while and in Keo Kamplueng there is no water management at all. Transplanting for the first time this year meant that they needed to think about water management, something they were extremely reluctant to do.

Constraints and Ideas

The annual drought around August and excess of rain in September are identified as the major constraints. In all the villages there were few ideas how to overcome the drought except for setting up huge pumping machines to pump water from several kilometres away. Excess of water is also

5 *A yong is like a bucket with two ropes on two sides. By swinging and pulling on the ropes the water can be transported over bunds or dams or into a canal lying a little higher. It needs two people.*

6 *A snach is a scoop hung from a tripod. With the snach more water can be transported than a yong. It is a typical tool to irrigate seedbeds and to fill fields for landpreparation and transplanting. Only one person is needed but those households with sufficient labour use two snachs for one field to get the work done quicker.*

perceived as a problem but one they will try and manage, except in Keo Kamplueng where they heartily complained of too much water but had no enthusiasm to drain their fields. The reason for this is difficult to understand. The topography, distance and layout of the fields would allow quite a simple net of drains. When mentioned, farmers replied that the drains would be wasting good land.

When asked what they would want improved, 3 out of 6 villages said that they wanted more water control for the wet season rice cultivation.

In Krang they wanted the village canal dug deeper or pumped full with a floating pump in the Sne reservoir, in Toap Sdach they wanted a canal from Sne Reservoir to their wet season fields; in Po Pluk they just wanted more water as the fields were too high and did not hold water very long. In Samraong they were quite happy with their water supply. In Keo kamplueng there was little interest in improvement and in Prey Sambuo the wet season crop was not important enough.

In 4 of the 6 villages, the wet season crop is felt as the most important crop. It is the least risky. Many different varieties are known and grown in this period.

7.4.2. Early Rainfed Lowland Rice (2A and B)

This rice crop is sown as soon as the rains allow it and usually cultivated on part of the area on which crop pattern 1 is grown. The early crop is cultivated when the rains are early and abundant (as was the case in 1994) or by households with access to an irrigation source. Yields are usually higher than the 1 A and B crop as short term high yielding varieties are used.

In Krang the village canal served as a source similar to the canal in Prey Sambuo. In Samraong several canals were available and most villages had ponds owned privately or communally. The first rains are sufficient to prepare the seedbeds and irrigate the seedlings. Supplementary irrigation is necessary for the land preparation before transplanting and the first few weeks after transplanting. The same tools are used as for cropping pattern 1. The harvest is timed to fall with the dry spell in August but often the paddy still has wet feet.

Varieties used are high yielding short term seeds, although in Toap Sdach where this crop was grown without any supplementary irrigation, traditional shorter term varieties are cultivated. Yields of the high yielding varieties are usually a little higher than the yields of traditional varieties but as farmers could not tell us the areas cultivated, exact figures were not calculated.

7.4.3. Late wet season recession rice (3A and B)

This rice crop is often called *Chomlok* by the villagers. Seedlings are transplanted when the water recedes in October/November. Farmers say that this crop can have good yields if irrigation is possible. If not, it is a risky crop. Under favourable circumstances yields can fall between 3.5 to 4 tonnes/ha.

Seedbeds are made in higher lying fields making use of the September and October rains. Similarly, the fields are ploughed during this period. Water gifts are necessary after transplanting when the crop starts suffering from drought. In Toap Sdach, farmers had dug ponds to irrigate from. In Krang and Po Pluk the Chomlok land lay in the Kampong Sne command area. In Keo Kamplueng, where no source was available, farmers only grew the recession crop if their wet season crop (1) had failed.

As the lower fields are usually further away (Toap Sdach over one km, Krang and Po Pluk 4-7 km), farmers say it is a labour intensive crop. The water level in the fields needs to be checked frequently and if necessary, added to.

A water gift is given one or two times after transplanting. The crop is harvested in January/early February and yields depend on irrigation possibilities.

Both traditional varieties and high yielding varieties are used. The traditional varieties are more drought resistant but give lower yields.

7.4.4. Flood Recession Rice (4)

The dry season flood recession crop is transplanted along with the receding water of the floods. To come to reasonable yields, irrigation is essential after the water line has receded. Farmers irrigate with flood water trapped in reservoirs, natural depressions or in the case of Prey Sambuo in rehabilitated canals. The fields are inundated and inaccessible throughout the wet season.

Five of the six villages grew a dry season rice crop, two with the aid of irrigation interventions. In Prey Veng, Toap Sdach grows a dry season crop along the banks of the Kampong Sne reservoir as does Po Pluk and Krang but the last can tap into the gravity irrigation system.

In Takeo, Samraong grows a little bit of dry season rice on the banks of a reservoir/natural depression and Prey Sambuo cultivates the dry season crop as the main rice crop, irrigating from 2 rehabilitated canals. In Keo Kamplueng no dry season crop is grown but there are families who temporarily migrate to Borei Chulasa to cultivate it. With very little success as the costs of temporarily migrating and the necessary inputs were far higher than the profits from the crop. Especially due to rats destroying the crop, the yields were extremely disappointing.

The seedbeds are made in the fields to be transplanted, guarded off with bunds to prevent damage to the seeds and to keep the water in the seedbeds. After transplanting, irrigation gifts become necessary. In Toap Sdach several bunds parallel to the shoreline were made to hold back the water and trap the silt. These bunds were only about 50 cm high.

For the 3 villages without irrigation interventions, *rohats*⁷ and *snachs* are used to lift the water out of the reservoirs into canals to the field.

The dry season recession crop is perceived by all the villages, except Prey Sambuo, as a risky crop with high demands on inputs, labour and water. The high yielding varieties demand regular

⁷ A rohat is a pedal wheel pump. By peddling, water can be lifted up to roughly 2 m.

water gifts and enough fertilizer making it a costly crop. Furthermore, rats are a major hazard. Those fields lying lowest and thus transplanted and harvested last are most prone to lose their crops to rats. Many households have abandoned their dry season fields and focus on the wet season and chomlok crop.

Especially, those households with labour shortage and little capital cannot afford such a risky investment. The general assumption that dry season rice cultivation will solve rice shortage problems needs to be carefully reconsidered.

7.4.5. Floating Rice (5)

Floating rice is cultivated in Samraong and Keo Kamplueng. The land preparation and broadcasting sowing takes place after the first rains. The rice grows along with the upcoming water to keep its head above the water level. Farmers tell us that the success of the crop depends on the speed of the flood coming up and the timing of it going down. Lando and Solieng (1990) give four factors: the timing of the accession of the flood, the rate of the rise of the flood, the maximum depth attained and the timing of its recession. The water can reach a depth of three meters.

Floating rice is cultivated on extensive areas and requires little labour input. The ploughing is most labour intensive but the majority of farmers hire tractors. The broadcasting of seeds is still done by hand after which the fields are left until harvesting time. It is an almost exclusively male crop, the only activity involving women is the carrying of the seeds to the field. Men say that women cannot work in the floating rice crop because:

- they cannot calculate the seed;
- the seeds are heavy;
- they cannot work as long as men.

However, women do broadcast the higher land and have to calculate the amount of seeds necessary then; women carry around children all day throughout the year who are often more heavy than a basket of seeds (one basket weighs approximately the same as a 3 year old), women make longer hours than men with less rest in general (see chapter 8.2.4).

Floating rice areas can be dammed to store water in order to grow a dry season crop. In Samraong those farmers with land where a reservoir would be created, did not create a reservoir. Apparently, their wet season crop and the little dry season they are able to grow in combination with other income sources is such that there is no urgency to produce more rice. In Keo Kamplueng the memory of the dry season crop during Pol Pot time was still strong. Especially the men thought it would be interesting to repair the dike built during Pol Pot time to hold water back and irrigate a dry season crop. The village leader was especially very enthusiastic. The district leader of Koh Andet agreed with the village and named three advantages of repairing the dike: irrigation facilities for a dry season crop; transport on the dike and fish breeding in the reservoir. The women of Keo Kamplueng reacted reserved to these plans. Some of their households had migrated temporarily to grow a dry season crop in Borei Chulasa to supplement the low yields of

the floating rice, but had lost most of it to the rats. Others had spoken to farmers growing a dry season crop to the north of Koh Andet with disappointing yields, rat problems and discontentment with the labour and inputs the crop demanded.

7.5. Irrigation intervention

7.5.1. Irrigation in Krang

In Krang a gravity system feeds the dry season (4) and Chomlok (3B) floodrecession crop. Especially the Chomlok crop profited from the rehabilitation as it lies higher and closer to the main canal.

The main canal is fed by the reservoir and a gate keeper is employed by the province to regulate the water level. According to the water users the canal is continuously filled allowing users to tap when necessary. The layout of the system is given in annex 2.

The MCC program works with community organisers (COs) who live in the project area. They visit the villages in the project area to discuss the program and encourage farmer interest and participation. Irrigation associations were set up with the assistance of the COs at village level or *samakums* and at system level, *sahakums*.

A canal keeper or irrigation association representative was chosen by the water users of each village to check the canal for possible damages, blockages or other problems. He is also responsible for organising communication between the water users themselves, between water users and the gate keeper, as well as between the water users and the provincial Hydrology Bureau.

The canal keeper of Krang said he walked the canal every day but had little else to do but attend meetings. The water users are not exactly sure what the canal keeper does but see him as someone they could turn to if necessary. If water users want the gates to be opened or closed, a few men take responsibility and go to the gate keeper, taking the canal keeper with them.

The village leader is for many as important as the canal keeper, some water users did not know there even was a canal keeper.

At field level water users open their canal inlet and their field bunds to irrigate. Some discussions take place with neighbouring field owners on who will irrigate when but on an adhoc basis. Within the program, it was planned that every tertiary canal inlet would have a user's group but there is no such practice. Very little collective decision making seems to take place. Water users consider this lack of necessity to make collective decisions as an important improvement, they have enough water and do not have to discuss about distribution, or rather fight for their water, or do night irrigation.

The irrigation association (*samakum*) was not perceived as a body of decision-making. Many water users refused to acknowledge its existence, others said its only purpose was to organise labour.

Those farmers whose fields lie far from the main canal and thus cultivate later into the dry season, have to irrigate from the lake downstream from the reservoir directly as the water from the canal system does not reach them satisfactorily. Many of the respondents had actually given up growing a dry season crop due to the risk of rats eating their crop and the difficulty of irrigating their fields.

7.5.2. Irrigation in Prey Sambuo

In Prey Sambuo the dry season crop is the main rice crop. A flood recession crop is irrigated with water from two rehabilitated canals, 94 and 95. (See annex 2)

In certain areas water from the two canals flows into secondary canals by gravity but usually only in the beginning of the dry season. The majority of water users have to pump the water from the canal into the secondary canal. Similarly, at this level certain farmers only have to open their bunds and let the water flow into their fields, others pump from the secondary canal directly into their fields or into a pond from which they will pump it into their fields. These mobile pumps are individually owned.

The intervention by Oxfam involved only the physical works necessary for rehabilitating the canal. To do so, certain villagers were consulted. The rehabilitation did not have a community organisation program for example setting up a water-users group.

Even though there is no formal water-users group, many informal groups exist to efficiently make use of the pumps and the distributed water. Before rehabilitation groups of neighbouring field owners (16 to 20 households) would organise pumping water from canal 15 into the other canal. This group organised as many pumps as possible, sometimes as many as ten, and calculated how long they needed to pump to service all the households. Everyone shared the costs for diesel and the labour necessary to guide the water to where it was needed. This took place three times a year. The village leader seemed to have been an important actor in coordinating these activities. Now that the canals are rehabilitated this is no longer necessary. Groups of 4 to 5 households come together to organise the pumping from the canal into secondary canals. Two pumps would be set up at the canal intake and two pumps would be mobile, going from field to field. If everybody has a pump no costs are shared. If some of the households do not own a pump, they have to pay for the time that the pump supplies their field and contribute to diesel or petrol costs of one of the pumps at the canal intake. Apparently several similar systems exist as well. The households negotiate with each other to determine the system most suitable for their needs and possibilities. In some cases the water users pump independently and inform the other field owners to close their bunds. This is not without conflict but if compared to Krang where a water-users organisation exists, farmers in Prey Sambuo are far more organised informally.

Every household uses a small diesel or petrol pump to supply the secondary canals. Those

households who do not own one, hire it for 2000r/hr⁸ (\$0.80). Households who have ponds use pumps or rohats to irrigate their fields. With the increasing accessibility of pumps, rohats are used by only a small minority. Most had chopped them up as firewood.

Both male and female villagers of Prey Sambuo were pleased with the rehabilitated canals as they no longer need to pump from canal 15 and the improved water availability saves time and costs of pumping. However, women are quick to point out that although the pumping has become less time consuming, the work in the field has become more labour intensive. (see par 8.1.)

Furthermore, only canals 94 and 95 were rehabilitated and not the secondary canals which they feed. Some of these canals beds lie much higher so that the water flows back into the rehabilitated canals. Several men and women said that rehabilitating these canals should have been done at the same time and perhaps gates could be constructed to minimize the reverse flow. Several households had taken the initiative to dig the secondary canals deeper by themselves not wanting to wait for further NGO aid.

Ideas for improvements were mostly given along these lines: rehabilitate the other canals (8, 16, secondary canals); make storage in secondary canals possible for a longer time reducing pumping even more; dig canal 94 and 95 deeper and longer; make gates and bridges. These ideas were given by both men and women. There seems to be no gender difference in what they want to improve and their constraints. Even though, Prey Sambuo knows initiatives in rehabilitating and maintenance of canals, the major constraint identified is the difficulty of asking people to work together. Words as "envy", "jealousy" or "people don't agree together" are used in combination with not wanting to take responsibility. Nevertheless, some add:

if the others do, I will do it with them.

Only one male respondent wanted to improve the canal in the village to irrigate the wet season crop.

The yields of the dry season crop are extremely high in comparison with other villages and for Cambodia in general. Yields average between 4 and 5 tonnes/ha due to the combination of yearly silt coverage improving soil fertility, improved water availability and the use of high yielding varieties.

7.6. Comparison between irrigation intervention and non intervention

The objective of both the interventions is to increase the dry season flood recession rice. In both Krang and Prey Sambuo the interventions affected the labour input for irrigation positively in the sense that irrigation demands less labour. However, in Prey Sambuo labour input for crop

⁸ *The local currency in Cambodia is riels. 1 US\$ = 2500 riels (average March - December 1944)*

production has increased. In Krang the Chomlok crop actually benefits more from the intervention, but the area for dry season cultivation is increased.

Nevertheless, the interventions have not necessarily decreased the risks associated with the dry season flood recession crop.

In both non interventions areas where this crop is grown, Toap Sdach and Po Pluk, as the intervention areas the risks discussed in paragraph 7.4.4 still pertain. In Krang these risks have stimulated households not to prioritize the dry season crop for household sustenance. In Prey Sambuo the favourable circumstances minimize the risks. As these circumstances are not applicable everywhere, interventions geared towards increasing dry season rice production need careful and context specific consideration.

The specific community organisation component of the MCC project has not yet led to a more communal practice of irrigation. As labour and capital are more restrictive resources than water, farmers organise on those instead of water. A water-users organisation might provide a convenient structure but further research is needed to explore on which interests farmers find it constructive to organise.



8. GENDER ANALYSIS

8.1. Trends in History

The division of labour in farming households is determined by how gender relations structure the agricultural process. Gender relations in Cambodia have been strongly influenced by its history of the past 20 years in combination with the present confusion of cultural values and norms pertaining to gender identities.

As in other societies where political and economic reorganisations have taken place due to wars or revolutionary forces, gender identities in Cambodia have been through radical changes. Historic changes that have taken place can be helpful to understand contemporary gender relations and how men and women perceive their role in society today.

Before the eruption of civil war in 1970, a fairly clear labour division existed in rural Cambodia based on a gender ideology set down in codes of moral conduct (*chbab*). These codes prescribe norms and values structured by age and sex.⁹ Ledgerwood ('92) defines this labour division to be "complementary" where tasks are divided along gender lines but a certain amount of flexibility exists so that with varying circumstances all tasks can still be completed.

The period from 1970 to 1975 is characterised by continuous fighting and a reorganisation of agriculture in liberated areas. In this context of war and transition, villagers tell us that their usual routines were disrupted. Both men and women were involved in fighting and restructuring society resulting in labour divisions based on pragmatism instead of norms and values.

The Khmer Rouge regime, installed in 1975, tried to optimize agrarian production in which labour in essence needed to be productive; there was little use for a cumbersome gender division of labour. In principle women were equal to men.

If the images of women implied in the chbab had any efficacy in pre-revolutionary times there was no place for such niceties during Democratic Kampuchea. Female had to be to male what male would have to be to female. (Halcrow, Annex E, '94)

After the overthrow of the Khmer Rouge in 1979, the country was once again reorganised, this time based on the Marxist inspired Vietnamese model. Families were allowed to reunite and the Krom Samaki was established. A collective production process was encouraged within which men and women identified their own responsibilities. However, the Pol Pot era and the ongoing civil war with the Khmer Rouge took the lives of many men, leaving women and children without husbands and fathers. (Boua and Kieman, '87)

The continued recruitment of male soldiers and the return of soldiers suffering from malaria,

⁹ For further discussion on these codes of moral conduct, see Ledgerwood '90 & '92, Halcrow, Annex E, '94)

demanding a production process primarily run and done by women. One could no longer speak of a division of labour as such.

After 1991, state subsidies fell away and rapid depreciation of the riel took place, strongly influenced by the UNTAC, as Cambodia changed from a centrally led economy to a free market economy. Uncertainties overshadow this transition as the instability of internal affairs do not encourage investment nor is there clarity on issues of law. The international recognition of Cambodia and the subsequent influx of multilateral aid, finds the country being confronted by structural adjustment programmes. The rural population is uninformed and learns by trial and error causing some to prosper and others to fall into unsolvable debt.

In recent years, war has been less demanding, there have been less casualties and boys have now the chance to grow up to be adults. The balance of the male and female population is stabilizing and slowly returning to normal, the female population now making up 53% of the population. (UNICEF, 1994) This results in yet another reorganisation of labour in agriculture. Men are slowly taking up the tasks that are defined as specifically theirs but which have been performed by women in their absence.

Comparable to other postwar contexts, men in Cambodia retake their place in society and women are moved out of their newly gained positions and responsibilities. A reorganisation of responsibilities and division of labour based on a return to former identities of men and women is taking place. One could speak of an attempt at reversing identities.

In reality, society does not allow such a reverse due to socio-economic dynamics in the rural areas and progressive forces in the country. Confusion has resulted from these opposing processes.

The division of labour before 1970 was relatively clear. Men and women knew certain well-defined activities. Today, men and women will grasp these when asked who is responsible. However, looking at who actually does the work, the picture is a little different. Women do many of the activities that men are "supposed" to do.

The following conversation is an example of this.

After discussing several topics we come to talking about irrigation. The woman says:

"My husband does all the irrigation activities"

Q: "Does he do all the irrigation activities?"

A: "Yes"

Q: "Do you do some of the activities sometimes, like checking the water in the field or opening and closing the bunds?"

A: "No, never".

Q: "Do you open and close the bunds sometimes?"

A: "No, never".

Q: "You just told us that your husband is often away, so when he is not there, who opens and closes the bunds?"

A: "I do".

Q: "Do you also go to open and close the canals, when he is away?"

A: "Of course, when he is away I have to irrigate the fields."

Q: "So, in the end who does most of the irrigation activities?"

A: "We both do about the same, when he is away I do it and when I am busy he does it."

Q: "So how come you said earlier that you never do any irrigation activities?"

A: "Because men do it."

For the understanding of today's agricultural process this confusion needs to be taken into account as it implies the following points of consideration:

1. Women have experience in most agricultural activities even though they and their husbands will refuse to acknowledge this;
2. What people say is not what they actually do;
3. Statistics from surveys need to be interpreted with utmost care.

This chapter discusses the resources labour, land, capital, water and knowledge. Insight into how men and women, within different households, have access to these resources and who can exercise control over them leads to an understanding of gender relations in the agricultural production process.

Table 6 compares the actual division of labour and the culturally encouraged division of labour for a few major activities.

Table 6. Comparison of what men and women are supposed to do and who actually does it.

Activity	Cultural	Actual
Rice cultivation -land preparation	Male	Male dominated but especially women in both de facto and de jure female-headed households have learned how to plough. Furthermore, women in an 40% of the households in all of the villages except Keo Kamplueng, clear the fields and make the bunds.
-transplanting	Female	This activity is still largely done by women, but is rapidly becoming gender neutral. Especially during the dry season, men join the women to transplant the fields in a shorter period of time.
-harvesting	Female	As more high yielding varieties are grown and several harvests a year take place, more labour is needed. Men and women both harvest the crop.
Irrigation	Male	Women in all the three types of households are involved in irrigation activities. Women in de facto and de jure households spent more time on irrigation activities due to temporary or permanent lack of male labour. The use of the tool is often regarded as the irrigation activity while, the activities which make the tool effective are not recognised as such. In the villages where pumps were used this was especially the case; men use the tools but women secure its affectivity.
Household (re)production	Female	Female. This remains unchanged. Women are helped by their daughters.
On and off farm income generation	Male Men are supposed to secure the family's needs. When asked who is the head of the household many answer that the man is because 'he earns the money'.	The cultural values on income generation are far from true: men do earn large amounts of money a few times a year, however, women are involved in a multitude of income-generating activities on a daily basis.

8.2. Labour

Cambodia's rice farming is characterised by a farming system run by both wife and husband in which rice is the main crop and a few secondary crops may be grown. Secondary crops encountered in the study are vegetables, palm and fruit trees. Production is primarily for household consumption and marketed when excess allows or cash is needed. As both husband and wife are involved in the same rice production process, tasks are sequential as male and female activities follow each other: men generally do land preparation followed by women sowing the seedbeds; women uproot the seedlings, men transport them to the field where women transplant them, etc.

8.2.1. Activities

Labour division is characterised by certain tasks being predominantly male or female. Other tasks can be done by both. Men and women take over from each other when necessary.

Men and women are busy throughout the year in which rice production structures their seasonal activities. If not much work needs to be done in rice cultivation, people start producing vegetables, cut and weave palm leaves, do petty trade, repair their houses or seek work elsewhere. There are very few slack periods during the year.

Table 7.1 shows the general labour division persistent in all the villages studied. Each part is discussed separately below.

Differences between villages are minor and lie primarily with those activities done by both men and women. In Toap Sdach, all predominantly male tasks are also done by a large percentage of women. For example, in 46% of the households women do threshing as well. Differences between households depend on the availability of male adult labour and whether female-headed households have the means to hire labour. If these means are unavailable, women will do all of the activities mentioned in table 7.1 themselves.

Table 7.1: Labour division in rice cultivation

Rice cultivation	MA	FA	Both	Non MA	HH FA
clearing field	X				
ploughing	X				
bunds	X		X		
preparation seedbeds	X				
sowing seedbeds		X			
transport seedlings	X				
transplanting		X	X		X
putting natural fertilizer	X		X		
putting chem. fertilizer			X		
weeding		X	X		
scaring birds		X			
harvest		X	X		X
threshing	X				X
transport paddy from field	X				
winnow		X			
manual milling		X			
pounding		X			
marketing crop		X			

MA = Male Adult

FA = Female Adult

Both = Both men and women. Where an MA or FA is also marked, less but significant cases of both are found.

Non HH = Non household labour

Source. Questionnaires, activity lists, semi-structured interviews and group discussions, 1994.

Similar to Ebihara's findings ('74) and Ledgerwood's ('92), the first stages of rice cultivation are male designated and the last stages female designated. Contrary to their findings is that certain female activities such as transplanting and harvesting are rapidly becoming gender neutral inside the household but remain gender specific outside the household. For example, men will transplant their own household fields readily but hired labour for transplanting remains predominantly female. This might be due to a general lack of male labour or that the cultural tradition is partly still

adhered to.

Given the Cambodian history and lack of male labour in rural areas, one would expect the male designated tasks to become less gender specific.

Table 7.2: Labour division in irrigation activities

IRRIGATION	MA	FA	Both	HH	
				MA	FA
Opening and closing bunds	X		X		
use of traditional tools			X		
Use of Pumps	X			X	
Opening and closing canals	X			X	
Maintenance tools	X			X	
Maintenance canals	X				
Meetings	X		X		

In general, irrigation activities are presumed to be male. Observations in the field question this assumption.

The irrigation activities identified in the study can be organised on two levels: the field level and the system level. Field level activities mean supplying water to the field only. System level activities are those necessary to get the water to the field. Women are actually just as involved if not more than men in field water management tasks. When it comes to system management, men play a far more prominent role.

The use of tools will be discussed separately in section 8.4.4.

Field level

These activities are watching the water level and opening and closing bunds to drain or replenish the field.

Figures including female-headed households give us a higher number of households where women open and close the field bunds than men. Prey Sambuo is an exception where in 75% of the households men do this job on their own. Generally, whoever in the household is available will do the job.

In Prey Sambuo, as a result of the introduction of small mobile pumps which men operate and the presence of men throughout the year, the impression is given that women are not as involved in irrigation activities. However, when we take a closer look, women are involved in a whole range of activities associated with the use of pumps. Women tell us that they might not operate the pump but help carry it or watch it while it is running. While their husbands are busy with the pump, women are responsible for directing the water in the field and preventing the force of water from

doing any damage. At the same time, women make sure that the bunds of other fields are closed. These activities are often not recognised as indispensable irrigation activities. They are not gender specific but ones in which women are frequently involved.

System level

System level activities include the opening and closing of system gates, secondary canal inlets, or pumping from primary to secondary canals. Furthermore, the maintenance of structures and canals in addition to the meetings to organise maintenance and distribution are included. These activities are applicable only in the villages where irrigation intervention has taken place. Certain activities such as directing water from primary to secondary canals by pump or gravity took place before the intervention.

All these activities are predominantly male. Opening secondary canal inlets and maintenance of structures and canals is done by women but far less than men. Women in female-headed households with lack of male labour or means to hire labour do all of these activities whenever necessary.

Both men and women go to irrigation meetings but only men are encouraged. The village leaders in Krang and Prey Sambuo first approach the men to come. In the absence of men, women are invited.

In Krang, the older women often go as they enjoy it as a social event. A few of these women said that the topic of discussion was of absolute no interest to them. Other women tell us that women go to meetings but do not participate: "we always agree, we have no ideas." This is an often heard phrase and perhaps a result of the harsh Khmer Rouge regime followed by a regime which closely controlled agrarian production. However, some of the women said that a separate meeting might be good for some women but they themselves did not care for extra meetings.

In Pre Sambuo the contrast is greater. Men attend the irrigation meetings from 50 % of the households; women alone form 16 % , and both husband and wife account for 16 % of the participants.

Table 7.3: Labour division in the production of secondary crops and livestock

Secondary crops and Livestock	MA	FA	Both
Vegetables -land preparation -cultivation -marketing			
Palm trees -climbing and tapping -cutting leaves -making sugar/wine -marketing	X X	X X	
Fruit trees			X
Livestock -oxen, cows, buffaloes -pigs, chickens, ducks	X	X	

Tapping and processing of palm sugar is becoming less popular. Frequently, households let others use their trees in exchange for 5kg of sugar per tree. Climbing is a dangerous enterprise which has to be undertaken twice a day per tree. This does not encourage young men to learn it. Furthermore, the lack of male labour and the labour intensity of palm sugar production makes other alternatives more attractive. In all villages, it was becoming more and more difficult to find men willing to tap trees and often palm trees were exclusively kept for their leaves.

Even though men are mainly responsible for the care and grazing of cows, oxen and buffaloes, children (especially boys) take the animals to graze.

Table 7.4: Labour division in household production

Household production	MA	FA	Both	Non MA	HH FA
firewood collection		X	X		
water carrying			X		
food collection		X			
cooking		X			
baby minding		X			
childcare		X			
washing clothes		X			
cleaning house		X			
food processing (prahok etc)		X			
carry food to field		X			
shopping		X			
prepare food for labourers		X			
house repair	X				
weaving leaves for house		X			

As the table shows women dominate household production activities. Men do not undertake domestic activities regularly. They will only cook or wash clothes if women are unable to do so. Firewood collection and the making of handicrafts such as baskets, mats, shingles, strings, etc. are done by both.

Table 7.5: Labour division in off-farm activities

Off Farm activities	MA	FA	Both	Non MA	HH FA
wage labour agriculture		X	X		
wage labour non-agriculture	X				
exchange labour		X			
petty trade		X			
handicrafts (baskets, mats, etc)		X	X		
fishng	X		X		

Differences between villages are minor. In Krang there is very little exchange labour; in Keo Kamplung and Samraong agricultural wage labour is done by men and women while in the other four villages the women outnumber the men. The differences lie more in the type of wage labour done or the type of goods traded and not so much who does it.

Fishing is one of the alternatives men prefer to tapping palm trees. Women and children do fishing on a smaller scale in canals and small ponds, women market the fish. Every household has fishing nets and the activity is becoming more and more popular among the men. Women do not always agree with this shift. They now have to buy the sugar and making sugar was a secure income source while fishing is not. Additionally, when men go fishing they are gone for most of the day, while tapping palm juice takes a few hours.

Table 7.6: Labour division in community activities

Community activities	MA	FA	Both
construction infrastructure	X		
construction irrigation works	X		
festivals		X	X
village meetings		X	X

According to our data, the often cited idea that women are responsible for community activities cannot be supported by the very small difference in male/female involvement in the other community activities and when community construction is included. Perhaps this is influenced by the lack of community activities in general.

Men are more often involved in construction activities although the relative dominance varies according to village. In Krang for example the difference is very small (in 42% only men and in 21 % women also) unlike Prey Sambuo where men are clearly in the majority (70% men and 14 % women).

De facto female-headed households supply more female than male labour but also choose not to be involved at all. Women are indirectly involved in construction activities, as they prepare and bring food to their family members at the construction site.

Women go to festivals and meetings more often than men. However, in 69% of the households both men and women participate in festivals and in 15% only women do. Presence at meetings is influenced by the presence of men in the village. In Prey Sambuo, where men did not leave the village to seek other income sources, as many men as women go to the village meetings. In villages where men are temporarily absent women frequent the village meetings.

Contribution of child labour

Daughters supply far more labour than sons. In addition to helping their mothers in domestic activities, daughters join their parents in the field at a much earlier age than boys do. Parents say that girls can start working fulltime in the field when they reach the age of eleven or twelve, to whereas boys cannot work in the field until they reach the age of 15/16:

they are too small or they are too weak.

Daughters help with transplanting, harvesting, milling and pounding as well as opening and closing bunds and looking after big and small livestock. Boys look after cows, oxen and buffalos and help out during the harvest and with threshing. In Takeo and especially Keo Kamplueng and Samraong boys are much more active. Perhaps this is because schooling facilities in Prey Veng are better than in Takeo.

8.2.2. Daily time allocation

With the help of daily activity lines, an attempt was made to put men and women's daily routines during the wet season and dry season on a time scale. The lines provide insight into time allocation along seasonal and gender lines. The discussion given below is based on 48 typical cases. To use the cases, the following factors must be taken into account:

1. The moment of interviewing: seasonal factors determine the daily routine. For example, the men in Krang were busy ploughing while the women were more involved in domestic chores as the seedlings were not ready to transplant. In Prey Sambuo, the men and women were both in the middle of preparing fields and transplanting. The differences between the wet and dry season are quite marked, and context specific.
2. Both male and female farmers found it difficult to put their day in a time format. It is difficult for farmers to express their activities in time and to distinguish between the multitude of activities they undertake every day.
3. In addition many will be quick to point out that one working hour is not like another. The burden or complexity of the activity is not expressed in the time spent on it. Examples readily at hand are men ploughing in comparison with women taking care of children or men making string while women cook.

Given all these considerations, daily time lines provide information on the flexibility in time allocation of the household members. In other words, the time they can make available to inform themselves, educate themselves or participate in government or NGO programmes emerges.

Between villages

In Prey Sambuo women perceived the wet season as less labour intensive when they take longer rests (4 hrs) at midday and are involved in activities close to the home which they can combine with childcare or domestic activities. The dry season on the other hand, meant long days (16 hrs versus 9hrs in the wet season), little rest and many hours away from the home.

In Krang, the difference lay in the type of activities more than in hours spent. In the wet season rice cultivation was the most important and in the dry season the marketing and the production of palm sugar. The reason for this is that the dry season rice crop is not as important and petty trade is more lucrative as households have rice/money to spend after the wet season harvest.

In Krang only very few women or men gave daily lines involving chomlok or dry season rice cultivation. Only one man and one woman did so. However, many women spoke of the arduousness of these cultivations as the fields were so far away demanding them to get up early and spend the whole day away from home.

Between socio-economic groups

The improvement in socio-economic conditions does not mean a withdrawal of women from agricultural activities. Her involvement is determined by:

1. the age/number ratio of children in relation to the presence of a carer. If there is no one to look after the children, the mother will stay at home and not take them with her;
2. the age of the woman. When a woman reaches a certain age (50/60+) and labour is sufficiently available, she will no longer go to the fields;
3. whether she is pregnant or breastfeeding. A pregnant or breastfeeding woman is replaced by hired labour.

The socio-economic setting does determine the **type** of activity women are engaged in. The more land a household has or the more labour it can hire, the more time a woman has to spend cooking for these labourers. For example, in Prey Sambuo women in couple-headed households with ample land, spent longer working days (16 hrs) whereas women in households with little or no land came to an average of 13 hours. The latter spent less time on having to cook for labourers or for themselves as they are fed by the landowner, coming to 2-3 hours less work a day.

Between the three types of households

Women in the de facto female-headed households and women in the poorer households spend more time on marketing than women in couple-headed and female-headed de jure households. Due to a lack of labour in de facto female-headed households and lack of means in poorer households, rice production is not sufficient for household needs.

Furthermore, the women in de jure households and couple-headed households market their own farm products such as vegetables and fruit while the former are more involved in marketing non-agricultural goods such as groceries, clothes and home made sweets. This excludes the marketing or trading of rice which nearly every household does.

In Krang, women in de facto female-headed households worked longer days (11 hrs) in comparison with women in couple-headed households (9hrs). Remarkable in the lines drawn by the de facto female-headed households was the lack of any mention of typical male activities undertaken by these women.

Between men and women

Men seem to have their rest in the morning while the women have it in the early afternoon. This difference was also noticed when we tried to organise a meeting at a suitable time for both men and women. The men wanted it in the morning or late afternoon while the women wanted it in the early afternoon.

The men usually have their major activities such as ploughing in the morning and their more domestic activities, like making string, in the afternoon. The women work the whole day with midday breaks. See the cases in annex 8 for examples.

For this reason women's days in Prey Sambuo are 2 hrs longer in addition to the time they spent on cooking, while the men can rest.

Women in Krang work the same hours as men in the wet season and less in the dry season. A note must be made that the lines were drawn when transplanting had not yet begun while ploughing and raking was in full swing.

In both villages men take an hour to an hour and half longer rest than women during the wet season. In the dry season this is more or less the same, men taking an hour shorter rest in Prey Sambuo.

Even though one would expect women to have several domestic obligations in the evenings while men could possibly rest, none of the lines support this.

Irrigation

Not in one of the daily lines is there any mention of specific irrigation activities. Even though respondents were not asked specifically to include irrigation activities, it is remarkable that in only one case a man speaks of "looking at the water in the field" and in another one "goes to watch the chomlok field". By observation though, women and men are busy with snachs or opening and closing bunds and many (men and women) speak of having to spend a lot of time distributing water during the dry season involving the opening and closing of canals and bunds, going to the gate keeper, watching the speed of the water receding, carrying of pumps and organising communal use and distribution of water between neighbouring fields.

This lack of irrigation activities in the lines might be because they are not perceived as distinct activities such as transplanting or weeding. The activities identified were either typical (carry water, child care, cleaning house, etc), arduous or time consuming (collect firewood, transplant, plough) or income-generating (make strings, weave leaves, go to the market, make sugar). Apparently, irrigation activities are not typical, arduous or lead directly to income generation, or were simply forgotten.

8.2.3. Labour shortage

Labour shortage will overrule the existing labour division: women will plough if there are no men to do it, men will transplant if there are not enough women to do it. Labour shortage is determined by the possibilities in the village to generate sufficient income and the specific rice cropping patterns and climatic regimes of the region.

The availability of male labour is less than that of female labour. On average, 60% of the labour force is female. The seasonal availability of labour fluctuates for men and women and between villages. One should appreciate its diversity. In some villages there was a lack of female labour at peak times in the rice cultivation, while other villages have a lack of male labour throughout the year. The lack of male adult labour is felt most in poorer female-headed households. However, those couple-headed households where the male adult has a physical handicap or suffers from illness should not be overlooked.

In villages where the dry season rice crop is possible, its profitability and the types of inputs available will determine either a lack of female labour or lack of male labour.

Villages with a profitable dry season crop (Prey Sambuo) experience a lack of female labour in the dry season. The crop is planted along with the receding water. Women say that the irrigation and the variety has made it possible to plant more seedlings but at the same time limit the time in which it needs to be done. The situation now is that the women have to plant more seedlings in less time. This either implies women working longer hours and doing more exchange labour or having to hire labour.

Villages in which rice production is insufficient to meet the community needs and where migration labour is one of the solutions (Toap Sdach and Krang) experience a lack of male labour throughout the year.

Activities villagers mention as being generally affected by labour shortage are transplanting and harvesting. Especially when rains are early or late and the cropping calendar is moved up. Nevertheless, people will return to the village and schools are on holiday during these two busy times of the season.

8.2.4. Labour organisation

The organisation of labour is based on availability of labour in the household, exchange labour and hired labour.

The availability of productive labour in the household determines how much labour needs to be exchanged or hired.

In general age is a more important determinant than gender. The older the person the more access he or she has to his/her intra-household labour and non household labour. This is invariably connected to the parent-child status.

Children have no control over their own labour or access to that of others. Parents have access to their children's labour and within the household control this labour. From the interviews both parents share control in as many cases as where the mother or wife takes labour allocation by herself.

Exchange labour knows several different systems. They all have in common that not the sex of the labourer is of influence but the particular task for labour which is exchanged. If a man transplants one day, a woman can return one day of transplanting as well. The particular tasks, however, are

gendered. In general, half a morning of ploughing (male) is returned by one day of transplanting (female). The argument for this is that for ploughing one needs to take not only the human labour but also the labour of the draught-animal into account.

Labour can be exchanged between families, neighbours (neighbouring fields), friends or between the previous krom members. Exchange labour is most frequently arranged between family members, however, in Toap Sdach and Po Pluk informal use was made of the kroms.

Exchange labour is practised for transplanting, harvesting and threshing. Far more women are involved in exchange labour than men.

Families hire labour primarily for transplanting and harvesting; in certain villages only for transplanting, in others for harvesting or for both. In areas where transplanting or harvesting needs to be done within a specific amount of time most households do hire labour. In Keo Karnplueng, where vast areas of floating rice land is cultivated, villagers hire Vietnamese labour from across the border. Their labour is cheap and abundantly available.

In villages where this is not the case rich and middle households hire labour while the poorer families will keep to exchange of labour, regardless of the type of household. Women tend to have more say in the matter of hiring labour. Perhaps their room for taking the decision is defined by the tasks being female designated.

Wages differ vastly between villages and even within villages. Most common is 1500 r/day (\$0.6) including food paid to men and women. This is reasonable if compared to government wages of approximately 1250 r/day (\$0.5).

Prey Sambuo has a more intricate wage system. Respondents gave different answers which suggests that wages can be negotiated. All agree though that wealthier families pay better wages and serve better food. A poor woman tells us that she pays 1500r/day plus food while a man in a middle households confesses to paying 4000r/day plus food.

Prices also differ between the wet and dry season. The wet season pays better as there is more water in the field when transplanting and the stalks are longer and lying down when harvesting. Most common in Prey Sambuo for transplanting is 2500r/day (\$1) and for harvesting 500r/40 bundles (this can add up to between \$1 and \$2/day depending how fast the labourer works). In Samraong and Keo kamplueng wages were paid according to the acreage harvested.

In all villages higher wages are paid for ploughing and threshing coming to 2,500-5000r/day (\$1-2). Both are male designated task. The reason given is that the draught-animals also need to be paid for.

A very different but common means to gain access to labour is through dependency relations. Debt relations are common sources of labour supply. Households may lend money in order to expect the borrower to feel bounded and supply labour on demand. The reverse also occurs; poorer households donate their labour and in return feel they can approach them in times of need for rice or cash.

8.2.5. Involvement of men and women in different rice cropping patterns

The difference in rice cropping patterns is one of the factors resulting in different labour divisions. One household can be involved in several rice cropping patterns and these patterns vary between geographical regions. Hence, labour division in Cambodia along gender lines is not uniform.

For example, floating rice is nearly exclusively cultivated by men, whereas the other wet season rice crops are cultivated by both men and women.

Men are also generally more involved in dry season rice crops than women. Activities which women undertake during the wet season, such as sowing the seedbeds, weeding, harvesting, men will do together with the women in the dry season crop.

There are two exceptions: in Prey Sambuo the production circumstances demand such high labour input that both women and men are needed full time. As yields are high, the labour input is rewarded with high returns.

Another exception is Toap Sdach where the dry season crop is so risky that men opt to look for off farm work elsewhere and leave the crop to women.

8.2.6. Importance of rice in comparison with other income-generating sources

Disparities in labour division between villages, is closely linked to the importance of the rice crop in comparison with other income-generating sources. In those areas where rice does not constitute an interesting marketable product men are absent for parts of the wet and dry season. Men leave the farm for several weeks to look for work elsewhere, usually to drive cyclos or mototaxis in Phnom Penh or to cut wood in Koh Kong. Their wives stay behind to look after the rice crop.

Men leave the crop to be managed by the women while women will combine cultivation with off farm income sources. This corresponds with the general conclusion that men are involved in a few specific income sources while women draw upon a whole scale of income-generating sources which they combine with a routine of daily activities.

In these villages only few households are involved in trading with rice dealers from larger markets close by selling 7-10 bags of rice a year. (1 bag = approx. 84 kg)

In villages where the conditions are favourable for a profitable rice crop men have no need to generate income elsewhere. Successful households are able to sell over a hundred bags of rice a year.

8.2.7. Conclusions

Various studies have argued that there is no strict gender division of labour as such in Cambodia, nor cultural prescriptions that would strongly engender the division of labour (Halcrow, '94; Ledgerwood '92).

Ideologically there is a definite gender division of labour in Cambodian agriculture, however, in practise this cannot be upheld. The patterns that surface from this study are that men and women have certain specific tasks in addition to many shared tasks. Men and women organise the cultivation of rice together and share the overall responsibility for the crop. In times of need they will help each other if labour shortage or climate demands it.

One can conclude that at this point in Cambodia, labour division does not involve a gender struggle, when compared many other countries where multiple crops are grown which are gender specific¹⁰.

At this point in time, labour in the villages of the study is in the first place organised on the basis of farming rationale and to a lesser extent on gender interests. The successful cultivation of the rice crop seems to determine labour allocation. It would be interesting to follow the development in labour allocation of men and women in the coming ten year. It is quite possible that - in the near future - gender interest will determine labour division to a higher degree when the economic and political situation will stabilize.

The labour input of women in agriculture in the eighties and the early nineties, far surpasses that of men. In some of the villages, women's labour formed 80% of the adult labour force. Today this is reduced to 60% in the villages studied. With the increasing number of men in rural areas, women are quite happy to take a step back and let the men take over some of the work. This can only be perceived as a positive development for both men and women and for agricultural in general.

As a result, the gender division of labour is becoming stricter and specific female activities are becoming gender neutral (uprooting, transplanting, harvesting). This must be followed with utmost care as can already be observed with irrigation interventions, men are more involved and are actually taking over its management. It might relieve women from a lot of hard and tedious work but simultaneously oust them from decision-making processes concerning the rice crop as men are participating in all stages of production.

Will women eventually even lose their control over the marketing of rice?

This will depend on how much attention rice cultivation will be given by development agencies in introducing higher yielding varieties, improving irrigation and marketing facilities and how successful this will be in making rice production profitable.

The ideology concerning labour division provides a good framework to eventually lead to women's loss of control over rice production.

Contrary to what is done in reality, ideas on division of labour (what man and women *should* do) are based on gender interests. As encountered throughout the region, physically demanding labour is perceived as the men's domain for which they are respected and their labour highly

10 *For example, countries where men control the irrigated crops and women the rainfed crops. Or where men control cash crops and women food crops which can both be irrigated. A third possibility is a combination of these two.*

valued. Women's labour is viewed as incidental:

"Women are only good for transplanting", "women do not plough or irrigate", "women do not do any heavy work"

as opposed to

"men work much harder than women", "men earn the money in the household", "men are more intelligent than women".

Women's labour has very little value in the eyes of both men and women. Their labour input is recognised but not valued accordingly.

In Prey Sambuo, a couple have one son and one daughter. The son is encouraged to study, no stone is left unturned to pay for the fees and housing costs. Even a parcel of land is sold.

Meanwhile the daughter is allowed one year at school and then taken off to help on the farm. The daughter helps her father in all of his activities, does the work assigned to women and goes for wage labour to add to the family's income. Her father wounded his leg a year ago and she has taken over most of his activities as well.

The son finally drops out of school after having failed several times. He marries and lives with his wife. He helps his parents and sister in exchange for labour on his farm.

When I exclaimed that the daughter kept the farm going and showed my admiration for the amount of work she does throughout the year, the parents replied: unfortunately it is the daughter and not the son. Of course this reply mirrored their disappointment with their son but it also reflects the lack of value for their daughter's labour input, it seems to be taken for granted.

When asked who decided to take the daughter out of school, the mother replied it was not a decision to be made, it was just done.

The daughter said she enjoyed working in the fields and did not mind having missed an education. She said her parents had no help and that it was her duty to help them. Once again she would say that she enjoyed working in the fields adding that she could not leave her parents when they needed her. She repeated this several times.

This case suggests that the daughter has exchanged her own wishes and desires for those of her parents and keeps repeating herself to make us and herself believe she has no personal interests but only those of her parents.

This can be said of women in general and not only in Cambodia. Nevertheless, the lack of resistance to these ideas could be a result of the cultural and historical development and the instability and confusion of today's Cambodian rural context shaping gender relations.

8.3. Land

8.3.1. Landownership

Landownership is a very complicated issue in Cambodia today. The land division which took place in the eighties did provide a fairly egalitarian distribution. However, land reforms is a policy measure, village dynamics influence its outcome. A land reform is a reshuffle after which social processes will give shape to new land divisions. Furthermore, the influence of political connections during the distribution and the possibility of reclaiming land owned before 1975, urges one to look at landownership in further detail.

The question of rightful ownership is another and as confusing issue. In principle, people can apply for land titles by filling in the necessary forms with the help of the village leader. Via the commune office they are sent to the district land titles office.

Very few people have received the official permanent titles. In the villages of the study, villagers generally applied for titles in '89/'90 and have up to date not received their titles. Several had temporary titles, others none at all.

The district land titles office in Baphnom explained the reasons for delay. The procedure is as follows:

- 1) Farmers apply for a land title;
- 2) The applications are checked by the commune office;
- 3) The district office after receiving the application from the commune sends their staff to measure the plots;
- 4) For every plot a title is made up and the cards are sent to the province to be stamped;
- 5) The titles are distributed to the owners.

The district office faces several problems:

- the office is staffed by only 3 people, the province has sent some temporary staff who earn per hour resulting in little stability or continuity;
- there is very little equipment (only measuring tape) or knowledge on how to measure acreage;
- there is no transport;
- if the province disagrees with a title application, everything has to be redone;
- before and during elections the villagers did not want their final title due to the uncertainty of what would happen after elections. This made the measuring of land by the title office very difficult and caused much delay.

Since 1989, there are 600,000 applications for 108 villages in Baphnom district. Of these, only 2767 applications have been successfully given. This means that about 900 applications are dealt with yearly, implying that it would take 600 years to finish the applications they have now, not including the steady stream of new applications coming in.

The other districts have the same problems. Some are better, others are worse off than Baphnom. It helps if a village leader comes to the office frequently and asks for preference treatment.

Official title deeds were not encountered in any of the villages. Many had no idea what the importance of a title was. Not having a title did not seem to particularly concern anybody. Discussion did arise when a widow was told how much land was recorded on the temporary title. She became furious as the village leader had written down too many ares. Her anger was directed at her lack of control over the procedures on the one hand and at the uncertainty of not knowing what it implies for her in the future on the other. What happens to those who have more land on their title than they actually cultivate? Is this punishable when a land law will finally come into being? Villagers have no idea what is actually legal in today's Cambodia and they are wary of doing anything that might in the future get them into trouble.

Another illustrative occasion was the names on a woman's title were read out to her. Only her husband's name was on the titles. She became very upset as she had told him when he went to the village leader to submit the forms, to put both their names on every title. The influential position of the village leader and the illiteracy of many can lead to incorrect and even manipulated title applications. It may actually lead to an official loss of land when titles become legal property evidence. Perhaps fortunately, this is far from being the case just yet.

The bar graphs in annex 9 show the official ownership (through temporary and permanent titles) of respondents in two villages. It becomes obvious that land belongs to the husband in far more cases than to the wife if it is not owned by both the couple together or their parents.

This has two consequences. One: that women have less control over land property than men and two: when titles will be used as official property claims women will have no evidence to negotiate with.

Landownership can change through buying and selling (which include claims as a result of debts), death or divorce.

If villagers change landownership they go to the village leader where the exchange is thumbprinted in his presence. Inheritance is decided by the parents while the division of land by divorce remains a point of discussion. Most common is that if there are:

- 1) no children: each parent takes back her/his piece or the couple divides it in two equal parts;
- 2) children: the one who takes the children, takes the land.

Most women agree in that they would only allow their husbands to take land if he would take some of the children. Besides those men who comply and leave all assets with the woman they leave, there are quite a number of men who leave their wives after having taken loans on the land or for which the abandoned woman will either have to pay or lose her land. Others take their share (or more) of the assets without taking responsibility of the children. Several cases are known where men will support the children monthly or whenever possible and some even supply labour on the ex-wife's fields.

In principle the land division was gender neutral but given the large percentage of female-headed households with generally fewer adults but with several young children, the illiteracy of women compared to men and the less political power of women the division did have a gendered impact. As a result, female heads of households were distributed smaller landholdings and have more difficulty securing their rightful titles.

When population pressure on land will increase, land shortage becomes an issue. Women's access to land should than be carefully monitored.

Not only the land reform has led to the present land distribution, but also the claiming of pre Pol Pot owned land, clearing of forest land, buying, inheritance, sharecropping and appropriation through debt.

Claiming land which households owned before the Pol Pot period has quite an impact on differences in land ownership. Even though the land division was based on labour power, households could augment their acreage by claiming previously owned land.

Given that in Prey Veng this is the land where irrigation facilities are improved, one can say that the claiming of land is a profitable possibility of access and increasing socio-economic differences.

Large areas of forest or bushland is being **cleared** for rice cultivation. Access to this land is primarily determined by the availability of labour power. Those families who could not profit are poorer female-headed households and young couple-headed households with no means to hire labour and little access to familial labour.

Of lesser but significant influence are the political connections by which households actually reserve the area they want to clear. Official regulations for clearing land are unknown. In general, the provincial government wants to prevent it but does not have the capacity to do so.

Clearing land can have detrimental effects on the environment in the respect of land exhaustion as well as reducing fishing grounds. If on newly cleared land water control is practised a third effect might be the curbing of the natural water flows which might change the local ecosystem if not on a larger scale. It is beyond the scope of this study to go into further detail, however, environmental changes are inherent to these practices.

In all the villages of the study the **buying and selling** of land was not uncommon. People will not admit to selling land as it is perceived as their most important resource: no land, no future. If a household does sell their land, it is their last resort.

Households who do sell land either have to generate cash for illness in the household, have lack of labour power or are in debt to fellow villagers or money lenders who after a long period of debt claim their land. Those households who are able to buy land are characterised as being from the richer and middle economic groups, those who produce surplus rice and have enough access to labour and livestock. They will not admit that a debt relation resulted in their increase of land property.

Further research is necessary to gain sufficient insight in the specific conditions of transaction. Irrigation facilities will increase the value of the land.

When children leave their home it is up to the parents if each child will be able to take the land which was officially distributed to them. If this does happen, men and women usually own their own parcels of land.

There is no gender bias in land **inheritance**. Parents will give their children an equal share of the farm or the amount they were distributed. Some parents do not distribute the land among their children but have their children cultivate it for them. With the increase in population land division among children resulted in plot becoming smaller. By not dividing the land into tiny parcels, the parents are ensured of labour and a share of the produce and they can have an asset to ensure care in their old age. Young couples were cited by all villagers to be among the poorest as the size of their land is not sufficient for their sustenance.

Often young women and sometimes young men are taken off school to look after their parents or grandparents. It is usually the youngest daughter or one of the granddaughters. For this child a larger piece of land will be reserved.

The couple is in their late sixties. He is the Wat keeper. They are very well off and were able to give all their children 0,8 ha. They still a little over 5 hectares themselves which is cultivated by their children and grandchildren. Their daughter-in law lives next door with her children. Their son was killed in 1979. The couple live with one of their grandchildren, a young women of 15. She was taken off school when the couple decided they could no longer run the household by themselves. The granddaughter does all the household activities, works in the field and runs errands whenever necessary. In return for her care she will be given the remainder of the land.

The reason this couple chose a granddaughter was that she would be able to do all activities both agrarian and domestic while a grandson would not know how to cook or sow clothes.

Another old couple (in their seventies) were looked after by a grandson. They did not have to divide the land among the children as all the children had left home before the distribution took place. They will the give all their land (0,3 ha) to this grandson when they die. Their preference lay with a boy as he could do all the male designated activities. The old woman said she was still perfectly capable of doing all the other work. Especially interesting about a boy is that he will be able to do migration labour. This was in a village where land shortage was acute.

These children have no say in the matter. All they know is that they are ensured of a bigger piece of the property.

Appropriation of land through debt is a common phenomenon. Cases were encountered where households in desperate need of cash will rent out their land for a small amount of money.

Another possibility is when households have pledged their whole yield in return for rice or cash borrowed before the harvest. Finally, the lender takes the land instead. Some households are in such debt that they have pledged their land to one or more debtors to be able to take on an extra loan.

Decisions about who will inherit the land, who will become the land owner and when land is bought or sold seem to be most frequently decided by both the husband and wife. However, decisions taken only by the husband are quite common. Of the 31 cases in the study which bought land, in 20 cases the decision was taken by both the husband and wife, 10 times by the husband alone and only once by a woman who was a widow.

In de jure female-headed households decisions concerning land use and appropriation are taken either by the female head with or without the consultation of children or in a few cases by her parents.

8.3.2. Conclusions

Access to land is more complex than simply looking at acreage. The quality of the land, its distance to the house and the irrigation possibilities are factors to be taken into account. Moreover, the value of the resource land is closely linked to other resources such as labour and capital.

Decisions over the use of land are often shared by husband and wife. Men usually decide when to start preparing the field for cultivation and women decide which varieties are cultivated. In female-headed households these decisions are taken by the female head. Decisions on appropriation are taken by both or by the husband alone.

When land is not owned by both or by the parents it belongs to the husband in far more cases than to the wife. If titles are ever used as official property claims women will have less to negotiate.

8.4. Capital

In this section capital deals with rice, cash and credit, tools and livestock.

8.4.1. Rice

The different villages in the study have different rice production capacity. Within villages the differences are remarkably consistent. Poorer households have a shortage of rice for 5 to 6 months; the next poor for 1 to 2 months and the middle and rich have more than sufficient. In all the villages except Prey Sambuo, rice dealers could be found among the rich households, regardless of whether the household is female-headed or not. In Prey Sambuo such large yields were produced during the dry season that most households with land had a surplus to sell.

Households primarily consume their own rice produce. When the household experiences shortage it has various options. Most households buy or borrow rice before they have to eat their seeds. Every household is involved in selling some of their rice to have access to cash and using the

cash (or gold) to buy rice during the months of September to December when rice shortage is most acute and of course prices are highest.¹¹ An important source of cash to buy rice is small livestock.

If instead rice is borrowed, a system called *bolling* is practised in which households pay back twice the amount of rice borrowed.

Bolling is a widespread practice and for poorer households often leads to permanent debt relations as their yield is claimed by the lender. Households which need to boll, do so with various lenders and try to find households to lend from which are close to their own socio-economic group.

Before resorting to *bolling*, needy households will tap family relations first from whom they can borrow at a much lower rate or without any interest at all. In Samraong, a Cham village, villagers said their religion prevented them from asking interest and no one confessed to having ever paid interest within the village. The system of *bolling* did not exist in Samraong.

The control over seed selection, consumption, buying/selling and borrowing/lending of rice lies completely in the hands of the women in the household. If there are grown up daughters in the household, they will take daily decision on rice consumption and when the mother or mother in law is too old, she will be responsible for the other rice transactions as well. Decisions concerning when to sell or buy and at what price are taken by women. Women go to the market to buy and sell rice.

They are also responsible when rice needs to be borrowed. They usually contact a lender and they will have to account for the debt. This means that the control is with her but also the risk.

8.4.2. Cash

Cash is becoming increasingly important. The size of cash flows varies immensely between villages. In those villages where migration labour is an important income source or where rice is exported, cash has ousted rice as the only means of transaction.

Earning cash gives status and is supposed to be a male activity. "Men earn money" is a frequently stated observation; "men are heads of households because they earn money" is another. It is true that mostly men earn salaries or do migration labour generating a cash income, however, here it is argued that women actually are the major earners of cash.

Table 8 gives an overview of the different income sources and who the earner is. All the villages are included and the total number of respondents are approximately 300.

The income sources are arranged in order of frequency encountered by the respondents.

¹¹ *The range of prices for paddy is \$0.07/kg after the harvest in January to \$0.1/kg in (July), climbing up to \$0.15/kg just before the harvest in December.*

Income Sources	Season	Main Earner				
		MA	MC	FA	FC	M+F
pigs/chickens	whole year			X	z	z
vegetables	seasonal			X		
rice	seasonal			X		X
off farm labour	seasonal	X				
wage labour agriculture	seasonal			X	X	
salary	whole year	X				
fishing	seasonal	X				
palm sugar	seasonal	X				z
ducks	whole year		z	X	z	
petty trade	whole year			X		
fruit	whole year			X	z	
cows	whole year	X				X

MA = Male adult FA = Female adult

MC = Male child FC = Female child

M+F = where both men and women are involved.

X = main earner

z = minor earner

Women are the earners of the three regular income sources that nearly every household is involved in. Women therefore, do not only keep money they also earn it. They are involved in more income-generating activities than men and on a daily basis thereby supplying a regular flow of cash for household needs.¹²

The study did not generate data on income figures. Thus, we cannot speak of importance in terms of quantitative values.

Difference of access between households is determined by the type of household and its socio-economic means. Type 1 households are rarely involved with off farm labour or fishing, type 2 households are not involved in agricultural wage labour, fishing or selling rice and type 3 households are far less engaged in petty trade. The socio-economic determinants of income sources have been discussed in Chapter 6.

¹²

If we look at the number of women involved in income generation in comparison to that of men it averages to a 2:1 ratio.

Naturally, the person earning the money has access to it. As women keep the money they generally have more access than men to cash flows within the household. Men are known to have to ask their wives and mothers for cash. While women are continuously earning money throughout the year, men earn large sums at specific times. Thus they have direct access to these large sums and thus the ability to invest without discussion. Where women are involved in larger sums (rice dealing, pigs), a shared earning is mentioned in quite a few households. While a particular male source of large income through off farm labour is the sole territory of the man.

The impact of irrigation intervention on access to cash is fairly obvious. In Prey Sambuo the increase in rice production has led to an increase in cash flow in the village and a decrease of rice barter. The cash necessary for irrigated rice inputs such as seeds, fertilizers and fuel demand a community to search for cash sources thereby upgrading the importance of cash flows.

Women keep the money but this does not necessarily mean they control it. The general assumption in Cambodia is that women have full control over money. This assumption cannot be backed by this study.

As women keep the money, she has a certain amount of control because she **knows** how much there is. Metaphorically speaking, women in Cambodia have the key to the cash box but the decision over when the key may be used is not automatically hers. The issue of control over money is linked to the complexity of negotiating processes within the household. This question of control is important realizing the increase of cash flows in rural areas of Cambodia. It requires further research on negotiating processes considering aspects such as decision-making over different types of expenditures; the type and size of income generation; who earns what; the position of different women in the household and their position compared to men; the incidence of domestic violence within the household.

The following remarks made by women present the contradictions inherent to this issue:

- * *We decide on expenditures together, we always agree. (all villages)*
- * *We discuss about expenditures and sometimes he takes the final decision and sometimes I do. He decides on fertilizer and tools while I decide on rice, food and clothes. (next poor, Krang)*
- * *If he wants to buy cigarettes he must ask me for money. But I always give him what he wants. (middle, Toap Sdach)*
- * *As I keep the money I control it too. I know how much there is. I decide what is important. Women who cannot control it are stupid. They should not let their husbands have anything to say about it. The men know nothing of money. (rich, Keo Kamplueng)*
- * *I keep the money and when we have to make big expenditures my husband and I discuss it. But in the end my father has to approve. (next poor, Prey Sambuo)*

- * *I keep the money and I give my daughter money when she wants it. She then gives money to her husband. Actually, he never wants money and everything he needs my daughter has already bought. (Female-headed household, next poor, Samraong)*

8.4.3. Credit

Individual credit between villagers or especially relatives is common. Interests ranging from 10% to 150% are negotiated. Every village knows money lenders. No systems such as revolving funds or rotating funds, or savings land credit unions were encountered.

Informal cash loans are often paid back in rice where lender and debtor negotiate the rice price at time of lending and time of repayment. A lot of borrowing between friends and relatives occurs on a daily basis with little or no interest.

In Prey Veng the UNICEF's Family Food Programmes (FFP) organised a credit scheme where households pay a monthly interest of \$1.2 for \$40 loan (3,6% on year basis). Either the village leader or someone appointed by him is responsible to collect the interest.

Poorer households in villages where the FFP credit scheme ran, complained that the village leader decided who was eligible for a loan. Poorer households thus had no access as they were not considered credit worthy. Especially the poorer families were interested in getting a loan to raise pigs. Several of these households would not take a loan as they were afraid of ending up in a debt spiral. Other households did not want to take a formal loan as it would increase social control.

Apparently, the credit scheme is also used by the village leader or the person responsible for collecting interests to invest in private enterprises such as logging or private loans.

As with the borrowing of rice mentioned earlier, the responsibility lies primarily with the woman in the household. A difference is that borrowing cash, or gold for that matter, is much more a shared decision in comparison with rice transactions. How gender relations exactly influence the practice is unclear. Further study would be extremely interesting.

8.4.4. Tools

Both men and women use traditional tools such as yongs, snachs and rohats. Men usually pedal the rohat. Some women in Po Pluk told us that if women use the rohat it will have negative effects on conceiving children. It is unclear if this is a widespread belief. In several countries in Africa the same argument is given for not allowing women to cycle.

The snatch and yong are used by both men and women. In Prey Sambuo, where small mobile petrol or diesel pumps are popular (66% of the households use pumps), women are more involved in traditional tools. Pumps are either operated by the husband or by hired male labour, in only 6% of the households women operated pumps themselves. Nevertheless, women tell us that they might not operate the pump but help carry it or watch it while it is running. While their husbands are busy with the pump, women are responsible for directing the water in the field and preventing the force of water from doing any damage as well as opening the bunds of their fields and making

sure the bunds of others are closed. These activities are not gender specific but ones in which women are frequently involved and often not recognised as irrigation activities.

Women in de facto female-headed households either learn how to use the pump or hire male labour. Those with sons-in-law or sons have them do it.

An abandoned woman told us that she found it easy to use the pump. You apparently do not need to be particularly strong (as men and women tell us is the reason why women do not operate pumps). She added she had "only" used pumps up to 14 Hp (a small pump is 4 Hp). But if she was taught, she imagined she could learn how to operate any kind of pump in one day: "it is not difficult".

Interesting to notice is that most tasks defined as male are those which involve tools or means of transport. Ploughing, raking, irrigating with rohat, threshing, applying natural fertilizer, transporting seedlings and paddy by oxcart, irrigating with pumps etc. Women do the sowing, uprooting transplanting, winnow, weeding which require few or no tools. Even though women use snachs and yongs and mill the rice manually their access to and certainly control over tools is limited. Where men have a technological labour saving technique, women are left to use the traditional more labour intensive tools.

Furthermore, as is common elsewhere, a gender bias in favour of males reigns on all matters perceived technical. Technology development seems a male domain as women are assumed to either lack the intelligence or the skills. As the Irrigation Rehabilitation study (Halcrow '94) study discloses and women interviewed in our study support, women need to have the choice to be involved. It should be up to them if they want personal access and control or indirectly through their partners.

Activities associated with tools are higher valued than those without. Ploughing is more difficult than transplanting, threshing is more difficult than harvesting, using a pump is more difficult than preventing the water from damaging the fields. Using a tool makes an activity complex. Water management at field level deciding when to drain and when to irrigate demands far more knowledge than setting up a pump and starting it. One does not have to understand the complexity of electricity to use a pump but one should have some ideas on hydrology, soils, climatic regime, agronomy, and topography to successfully guide a rice crop to a satisfactory yield.

8.4.5. Livestock

A distinction can be made between draught-animals and small livestock. The responsibility for draught-animals is male designated and small livestock female designated.

Draught-animals are powerful assets in agriculture. Chapter discusses how the ownership of draught-animals can determine the socio-economic position of a household. With the privatization of means of production, households could reclaim the draught-animals they owned before 1975.

Each draught-animal was good for a landshare of a productive adult. This led to an immediate economic differentiation between households with and without draught-animals. Draught animals can be exchanged for labour or rented for cash.

There was no difference in ownership of draught-animals by de jure female-headed households in the study (25% of the respondents), and couple-headed or de facto female-headed households. The difference lies in the socio-economic situation of the household. There is, however, a difference in use. Female-headed households more often exchange or hire labour to use the draught-animals.

Small livestock are cared for and marketed by women. They form a substantial supplement in income.

8.5. Water

The resource water has many different facets: different sources, difference in quality and availability, differences in use. In this study the aspect of quality has not been given due attention because irrigation and drinking sources did not coincide in our cases. As we focused on making the link with irrigation, the quality of drinking water was only coincidentally touched upon. The sources generally available are ponds, wells, reservoirs and canals. Canals can be 'village' canals and canals rehabilitated through involvement of the two NGOs. Of these ponds reservoirs and canals are discussed as they are used for irrigation purposes.

8.5.1. Rain

The first thing everyone will reply when asked to name their water sources is *"the sky"*. The wet season rice crop is considered the most important in all the villages except Prey Sambuo, and the water availability for that crop is essential.

Successful water management of the field water level depends largely on whether the relationships with neighbouring field owners allows drainage from or into their field.

8.5.2. Ponds

Ponds can hold water during periods of drought or at the end of the wet season when the rains have stopped. Households dig ponds in their rice fields to overcome short periods of water shortage. For example, in Toap Sdach quite a few ponds in the Chomlok fields store water to irrigate at the end of the rainy season. In Prey Sambuo ponds are found in the dry season fields. The water from the canals are pumped into ponds and when necessary into the field by pump or rohat. In this way farmers have more flexibility for applying water in their fields. Some households have a pond with others and in and outflow is negotiated. Seedbeds can also be found on the border of ponds. Most of these ponds dry up during the Dry Season.

Ponds can be communal or privately owned. Everyone has access to communal ponds with differential access only determined by the distance between house and pond. There is no gender difference. If households want to make use of ponds owned by others, they need to ask permission but usually no remuneration is asked in return.

8.5.3. Reservoirs

Besides the large Kampong Sne reservoir in Prey Veng, two villages (Krang, Samraong) have a natural depression storing water close by their village. The stored water is used for bathing and letting animals drink. Households with fields close to these depressions use its water to grow a late wet season/early dry season crop.

The Kampong Sne reservoir in Prey Veng feeds two gravity systems downstream of which one was studied by the team.

Upstream from the dam, Toap Sdach uses the receding water of the reservoir to grow a dry season recession crop. (4) The water line is influenced by the two gravity systems. Villagers tell us that due to repair and construction work of the gravity systems the gates were closed for a longer period of time. Thus the water did not recede and the villagers chose to either postpone the crop or give it up altogether. This decision was determined by the site of the field. Those fields lying right on the reservoir bank could not be cultivated while those fields lying along an inlet could control the water level.

Several households came together to organise a meeting with the gate keeper of the Kampong Sne dam and were able to persuade him to open the gates for a certain period of time. Control and access of the reservoirs is the same for men and women.

8.5.4. Village canals

Village canals are often leftover constructions from the Pol Pot era. They therefore have hydrological problems inherent to constructing water ways without taking topography, watersheds, soils, etc. into account. One can stand at certain points of these canals and see the slope going upwards both ways or vice versa. These canals are filled during the wet season and are used as small reservoirs. Villagers build little dams across to store the water. These canals can store water from July until December.

In three of the six villages these canals were found (Krang, Samraong, Prey Sambuo).

The water is used for supplementary irrigation, for animal drinking and bathing, watering vegetables and in Prey Sambuo and Samraong the canal is used for transport as well. Fields lying along or close to the village canals, use its water to supplementary irrigate their wet season rice crops, especially seedbed water management is improved. By using rohat and snachs, the water is conveyed into canals supplying the fields. A lot of discussion exists in the village by those with fields lying further away wanting a more extensive secondary canal system to have access to this water. Unfortunately for them, the owners of the fields through which these canals would pass refuse to give up a piece of their land. Farmers are even hesitant to use land

area for canals beneficial for themselves to for example drain their fields. Those households which can afford it use pumps and tubes to bring the water to their field. No socio-economic factors or gender issues could be distilled in access to these village canals.

8.5.5. Rehabilitated Canals

The two irrigation interventions have been described in chapter 5 and 7. Availability, access and control will be discussed for Prey Veng and Takeo separately.

* Prey Sambuo, Takeo

The rehabilitated canals in Prey Sambuo are inundated from August until December and carry water throughout the remaining months with scarcity in the months of April and May. In principle there is no scarcity of water. Water shortage at field level is a result of distribution and not a problem of availability at system level. The water is used to grow a dry season flood recession crop. Pumping water by small diesel/petrol or traditional lift pumps is necessary to convey water to the field.

The canals are also used for transport and fishing.

Every villager can in principle be a beneficiary of canal 93 or 94 if their land is suitably situated. Everyone spoken to who owned land, had access to these canals. Apparently, before the canals were rehabilitated there was an exchange of land between poorer and richer households, where richer households would exchange a larger piece of land for a smaller piece closer by the intake. Today, this is no longer so. With the improvement of water availability such an exchange is no longer worthwhile.

Irrigation in Prey Sambuo needs a lifting device. Farmers use rohats and small diesel pumps ranging from 4 to 12 Hp. Households are dependent on these tools for sufficient water. Households without pumps (or cash to hire them) or without rohats and labour power to use them are seriously impaired in growing a dry season crop.

Women are discouraged to use pumps or rohats in general. And thus their direct access to the water is hindered. In section 8.2.1, the difference in participation of men and women has been discussed.

The distribution of water is informally organised. Constraining factors to these informal groups are unclear. Social connections help to be involved in sharing of pumps and getting information on when to pump. Some households have explained that especially canal 93 has a tidal movement making it important to know when to pump: when the level is highest and when nobody else has yet begun. Further research would be useful to generate insight on how these groups organise themselves and on the basis of which interests. These insights could contribute to the community organisation debate.

* Krang, Prey Veng

In Prey Veng the canals are supplied by gravity. The canal system in Prey Veng is unused from May until October. It carries water until the beginning of April. Villagers say that in general there is no water shortage for Chomlok land. Fields lying close to the Kampong Sne river can supplement the canal water with water straight from the river by pump or rohat. Fields lying far from the canals or in other words at the tail end of the secondary canals but not close to the river have water shortage during the dry season.

Water is used to grow a Chomlok (3B) and a dry season floodrecession crop (cropping pattern 4). At the intake of the primary canal at Kampong Sne the water is used for several different purposes: drinking, bathing, fishing. As far as we can discover, only fishing at this point has an effect where water is drained to easily catch fish, or where entrapments are set up by intakes to catch the fish and block up the secondary and tertiary canals. Fishing in the reservoir itself and its effect on the water availability was explained by a farmer in Toap Sdach in relation to up and downstream farmers:

The farmers upstream want the gates open in January so that we grow a recession crop with enough water in the reservoir and in time to harvest before the early rains; the farmers downstream want the gates closed until february/March so that they can do repair work and have a good flow of water when they need it. And the fisherman, they want the gates always opened a little so that they can easily catch the fish coming through.

This seems a typical case of up and downstream conflict. Unfortunately, the case is not as simple as portrayed above, farmers downstream do not only grow a dry season crop (4) but also a Chomlok crop (3B) needing water over a longer period of time. Plus the system has not been fully rehabilitated and to finish it the gates need to be closed. It might still take several years for the completion of the system which would mean a yearly repetition of the problem sketched above.

As in Prey sambuo, landownership in the system assures access to the system's water. Membership of the irrigation association (*samakum*) is open to everyone, men or women, but only actual water users are informed.

No specific tools are needed as it is gravity system but instead an understanding of intakes and the principles of check structures and gates is needed. Similar to the tools in Prey Sambuo, women are not perceived as being knowledgable on these structures. All women are informed on are the principles of opening and closing of tertiary and field intakes as it is similar to opening and closing bunds. When anything needs changing beyond these, the men are responsible. It is something "men do". In female-headed households women go themselves or try and find men to go for them. Men and women tell us that when the gates need to be opened or closed, the men must go as the gate keeper might want them to operate the gates themselves and, apparently, women cannot turn a wheel. The women themselves say they do not care. They have enough to do and trust the men to do the job.

Information is disseminated by the village leader or the canal keeper. They approach the man in the family and in his absence will tell the woman what she has to tell her husband.

8.6. Knowledge

Knowing how to select the right seeds or where to buy suitable chemical fertilizer can be extremely useful in rice cultivation. Knowing how to repair a house or make palm sugar can supplement a household's needs. Knowledge is accumulated daily and gained in many ways, for example by talking to someone in the market, from advice given by a friend, in school or from extension services. This section focuses on the sources of information men and women have as well as their differential access to education.

8.6.1. Information

Village leaders are the source of information on government policies as well as the activities NGOs are undertaking. They will always be the first to hear of it. Villagers, both men and women, consider the village leader as an essential source of information. Another powerful source of information is the radio and in most villages televisions are becoming popular. Every household that drew a daily activity line, mentioned an hour or more of listening to the radio every evening. Both men and women turn to their parents or the elders in the villages for advice.

No extension services were encountered except for the Family Food production programme by UNICEF in Prey Veng. Information about vegetables, fruit trees, compound hygiene and credit was given to families selected by the village leader. In Krang the village leader chose all the houses to the west of his house and in Po Pluk it seemed that most families willing could be involved. Female-headed households were given special attention. In Takeo, villagers could not remember knowing of any activity remotely connected to extension services.

When asked where men acquire information, they will name their travel companions and what they encounter during their travels or discuss on the work site. Women on the other hand say that their neighbours, relatives and friends working in the field are their important sources of information. For specific information on for example medicines, fertilizers, insecticides, they consult sellers in the market.

Men and women have differential access to sources of information as they have different possibilities of mobility. Women are discouraged from travelling far from their village. Men and elder women have little confidence in their sense of morality.

Nevertheless, the shortage of men and the responsibility the women have in marketing activities allows women to travel to markets. In Prey Veng, a few women would travel to Nek Lueng, a bicycle ride of about two hours, in Koh Andet women would cycle to different villages selling vegetables and fish. In Prey Sambuo the women travelled to Kandal to sell the rice to a rice depot close by Phnom Penh. When functional for the household economy women are not hindered in travelling.

Men are more used to travelling to district and provincial centres or to Phnom Penh, Koh Kong or Kampong Cham for migration labour.

8.6.2. Education

Education possibilities have always been very gendered in Cambodia. Before a formal schooling system was established, the monks in the Wats taught the boys how to read and write and learned about their religion. We spoke to one woman who said she had also learned to read at the Wat. She seems to be the exception to the rule.

When the formal schooling system reached the rural areas (1950-60) boys were encouraged to get an education whereas girls were not. Prey Veng seemed to have better schooling facilities than in Takeo. Girls having had education came from better socio-economic households. The poorest households did not send their children at all (this is much more the case for Takeo). Boys enjoyed about 4-5 years of education at the Wat and boys and girls usually 3 years at school.

During Lon Nol all respondents say they had to stop their education. Schools closed because of the fighting and the hardship at the time did not allow labour to be wasted on education.

Different accounts are given on education possibilities during the Khmer Rouge era. Some women tell us they learned to read in the field, others (men and women) tell us that there were absolutely no possibilities for any kind of information or knowledge generation.

The period after 1979 is characterised by adult education programmes. Many women went to school for one or more years and learned how to read and write a little. Quite a few women confess that they have forgotten everything and that at the time they thought it a waste of time. On the other hand, numerous women who had never had any possibility of education were quite happy with the opportunity and after the initial classes women were able to educate themselves to read and write fluently. We did not encounter any men who had been to adult education. If men were literate, they had enjoyed education before 1975.

For children it is a different matter. Even though, during the PRK period, literacy was propagated for both girls and boys, very few girls actually enjoyed an education for more than just a couple of years. The strong mistrust of women's morality is given as a reason why girls must not be educated:

They will only write love letters

Especially fathers say that if the girls have to leave the village for further education they will only spend time thinking about boys and will return unmarriageable. Educated women in the villages had trouble finding a husband. Men in Keo Kamplung told us that they would be uncomfortable marrying a woman higher educated than them.

Mothers say:

The sons have to be pushed to become educated so that they can earn money, girls are only good for transplanting or helping at home or sitting in the shop. And, I would like her to stay with me.

Mothers put more emphasis on the labour the girl provides and fathers on their morality. The above quotation also has an implicit opinion of women being less intelligent than men. An opinion

frequently aired by the older women.

Both parents agree that if they must choose who can further their education, they will allow their sons. Households with little financial room to manoeuvre cannot afford sending children to school outside the village as the costs of clothing and accommodation in addition to the loss of labour power are too high. Only in one family, interviewed in Samraong, the mother wanted all her children to have an equal chance and whoever turned out to be clever could continue regardless of their sex. Her husband disagreed saying it was not a good investment to let girls be educated.

This argument has some value and is used by most families. The girls have far less chance of finding employment with the government or NGOs compared with the boys. Out of 65 semi-structured interviews and 239 questionnaires, only 7 professional women were encountered of which 6 were primary school teachers and 1 had been a nurse.

Girls are usually allowed to go to school for several years so that they can read and write a little. The highest the girls get is up to 5th grade but the majority leaves after third grade. This is partly determined by the schooling facilities in the village. As soon as girls need to travel their possibilities for an education are reduced. Girls are taken off school to help in the field and at home.

Most boys finish the local primary school and if financially possible continue until nine or tenth grade. Parents say they will let their sons study as long as there is money.

We held numerous heated discussions on this issue of education as the opinions were so clear and so strong and so surprisingly consistent in all the villages. Although every family found education of prime importance for their children and would try and send all of them at least a few years, they persist in giving their sons preference.

8.7. Interaction of resources

8.7.1. How resources interact

The combination of the resources land, labour and draught-animals is crucial. The land reform was based on the availability of labour in the household: the more adult labour, the more land the household acquired. Increasing landholdings by clearing land is only possible if sufficient labour is available. Twice the amount of labour is exchanged for the use of draught-animals. Households with a lack of labour and without draught-animals are forced to sell their land.

Whether land is an important resource depends on its quality and the water regime. To come to reasonable yields in floating rice areas, a vast area is needed. Where soil quality is low and the water regime unpredictable, yields will be low and pests a hazard.

In all the villages, labour and draught-animals are far more powerful resources than land. Households with few adults and no draught-animals need to generate income outside rice cultivation. Often these are young couples whose parents have no capital to share or female-

headed households without children or small children. As soon as these children join the labour force, the economic situation will improve.

Households with capital reserves can overcome the problems connected to a lack of labour. Labour is a means to generate income but does not lead to capital reserves. Households with substantial reserves have accumulated them on the basis of pre-'75 owned assets and investing them in non agricultural activities. Households with less reserves accumulate on the basis of debt relationships which secures them of cheap labour, paddy and eventually land. These households can be both couple and female-headed. Even though the number of female-headed household is much smaller, female-headedness is not an economic indicator.

If we look at the resources from a gender point of view, we see that within rice cultivation men are more in control of land and draught-animals, whereas as women are more in control of labour and the product of labour: rice.

8.7.2. Water in relation to other resources

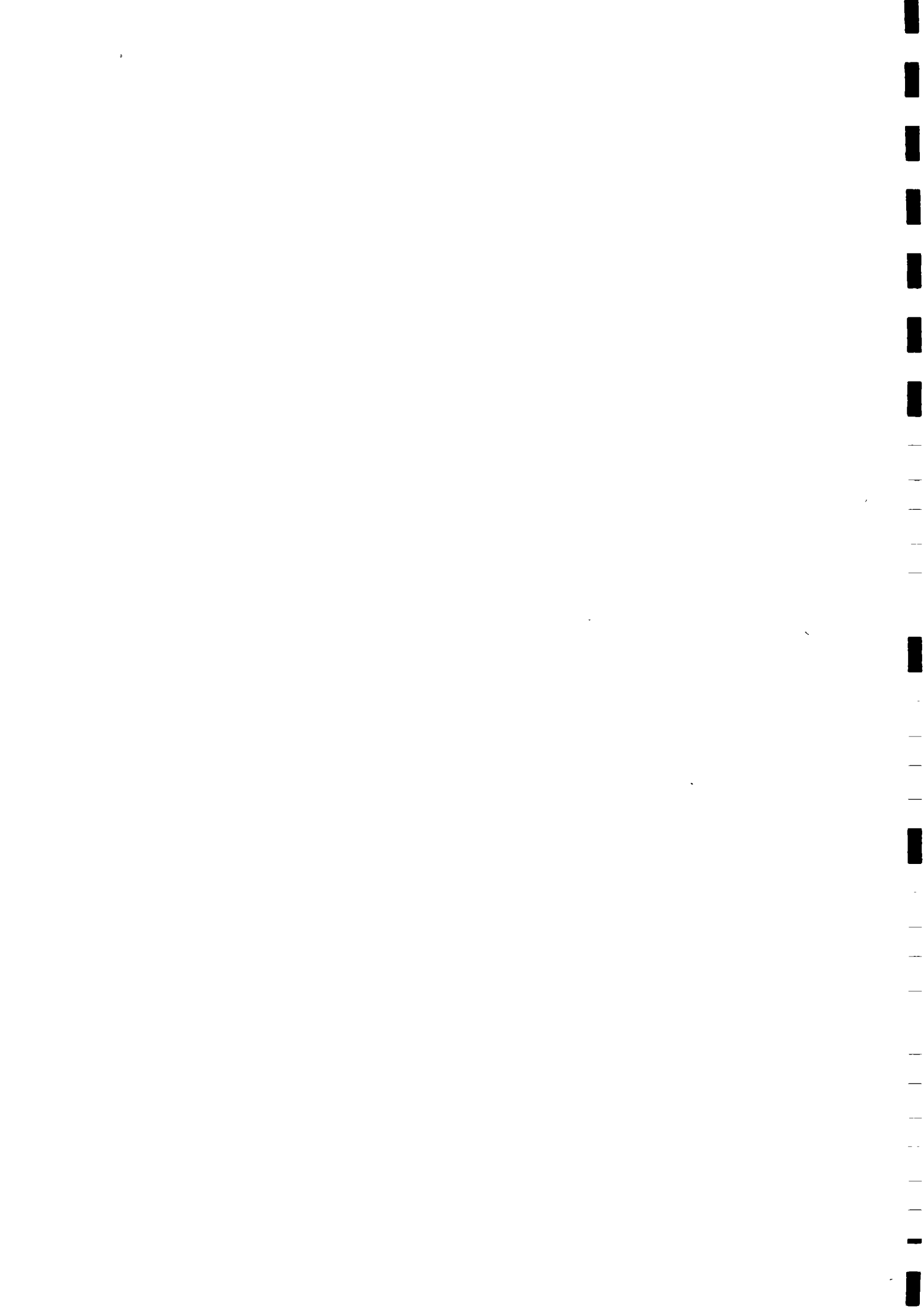
Water is an important resource within a rural area where rice cultivation dominates its agricultural production process. But water is not scarce nor do its sources have competing functions. Access to water is not decisive for socio-economic possibilities. However, the means to get the water to the field such as labour, tools and information determine if the household can make the water productive. For this reason villagers in Prey Sambuo organise on the basis of the economic use of tools and labour. For the same reason, in Krang the installed water-users organisation based on water is not effective as labour and capital are the more restrictive resources.

As the tools as well as information is less accessible to women, this means that women have less possibility in benefiting from the improved water supply.

8.7.3. Differences between intervention and non intervention villages.

The differences of access to and control over resources between villages where an irrigation intervention has taken place and in those where it has not is small. Having access to water is not as important as other resources. Differences are not so much related to the improvement of water availability but whether the household has the required other resources to make it productive. For irrigated high yielding rice cultivation, labour and capital are essential.

There is no gendered competition for water nor for different irrigated crops. The differences in gender issues between villages are not so much related to the fact that an intervention has taken place but the context in which it has taken place and the type of intervention.



9. GENDER ISSUES IN IRRIGATION: CONCLUSIONS AND RECOMMENDATIONS

9.1. Introduction

There are several reasons for studying gender issues in irrigation. The main reason is to understand whether men and women benefit equally from irrigation development. This is related to the access and control women and men have over resources essential for irrigation and their objectives in agricultural production. Furthermore, irrigation development is often based on general assumptions which are male biased and need careful reconsideration per context¹³.

In Cambodia, women have been the permanent factor in agriculture and were responsible for keeping the agricultural process going while the country was recovering from the years of Pol Pot, while a civil war was raging and political and economic transitions took place.

The percentage of female-headed households (26%) remains high as does the percentage of women in the labour force (60%).

This chapter gives an overview of the gender issues related to irrigation derived from the results presented in the previous chapters. As the study generated data with wider implications than gender issues in irrigation development, these will be given attention as well.

Irrigation development is a process in which different participants take part with different interests. The most important participants in irrigation development today in Cambodia are the government, NGOs and farmers. Contract and commercial rice farming were not encountered in the study and are not believed to be practised much in Cambodia just yet. However, plans are known to have been drafted by Chinese corporations to exploit unused floodplains during the dry season.

Government

Irrigation is perceived as a key sector in the governments objective of "striving to achieve sustainable growth with equity and social justice". By increasing the cultivatable area, improving irrigation facilities and stimulating double cropping the government hopes to increase the national rice production. As the final report of the Irrigation rehabilitation Study in Cambodia states:

Since it is believed that Cambodia is approaching self sufficiency in rice, and can continue to increase production through bringing abandoned land into production, the focus of irrigation rehabilitation should be economic growth....it should not be automatically assumed that irrigation is the best way of helping the rural poor. (Halcrow e.a., 1994)

¹³ These assumptions have been specified in section 4.2.1

Important questions to be answered in this respect are: who has access to the necessary input to increase production, who benefits from this increase and, more crucially, who suffers and what are the social and environmental effects?

Discussions at district and provincial levels provided a whole range of ideas. Some officials were more concerned with the prestige of having a project in their district than with the impact it would have. Others were caught up in contrasts between national policy and provincial interests in combination with recent changes in NGO policy. There seems to be little coherence between national policy and local practice and perspectives.

NGOs

The second group of participants in the irrigation process are NGOs. This not a homogenous group with clear or coherent perspectives on sustainable agriculture or, for that matter, on social issues. Within the irrigation sector a strong tendency reigns to incorporate community development concepts in irrigation activities. NGOs are searching for ways to put these ideas into practice in the Cambodian context where no legal structures exist for identifying rights and duties of the farming population concerned with irrigation. It is still very much at a trial and error stage.

Farmers

The third group of participants are male and female farmers or water users. They can be differentiated into socio-economic groups and gender. The impact of the free market economy on rice prices and costs of inputs will lead to further social differentiation, which will result in the interests of the farming population moving apart. The development interventions of government and NGOs should not be the reasons why rural women are hindered in their possibilities to use irrigation water and consequently why they experience a loss of control over the irrigated production process.

9.2. Gender Issues in Irrigation

The relationships between gender and irrigation issues derived from the study are the consequences of the changing agricultural process, the importance given to dry season rice cultivation, the access to the necessary resources, the debate on community organisation and the position of female-headed households.

9.2.1. The changing agricultural production process

The agricultural production process is in a very dynamic period where the free market has an influence, where the relative political stability allows for longer term planning and where the population imbalance between women and men is decreasing. The effect of all this is that changes are taking place that have not stabilised, making the situation complex and analysis necessarily

tentative.

The falling away of subsidies, and rice prices being determined by market mechanisms, will stimulate farming households to reconsider the importance of irrigation in relation to other income-generating activities. As women, and especially those in poorer couple- and female-headed households are involved in a greater range of income-generating activities they will be the ones who will have to determine the household livelihood strategy.

Caution is called for as, on the one hand, marketing activities are gender specific (men buy agricultural inputs, tools, sell land; women market rice, vegetables, groceries and gold), and on the other the control over cash does not lie as clearly with women as the control over rice does.

Longer term planning allows households to decide on investments in agriculture of which irrigation is one. If they have confidence in the political stability today they will have more confidence to invest in irrigation development. Households are willing to discuss investing labour in irrigation development. However the ongoing conflict with the Khmer Rouge and the unclarity of land tenureship makes them hesitant to invest in long-term goals.

The increase of male presence in villages and the taking over by men of activities that women carried out over the past decades due to the mens' absence, will determine the agricultural labour process in the future. Confusion reigns about what should be done and who really should be doing it, as people are searching for stability. Gender relations are being renegotiated now that many men have returned, and now that young couples are being formed and people are allowing themselves to look towards the future. The lack of recognition for women's labour combined with the relief women feel at being able to share their responsibilities, has allowed men to participate more in and increase their control over agricultural production. Cash is becoming increasingly important in relation to rice as a medium of exchange and women do not control cash like they control rice. The influx of cash economy and the taking over of activities by men raises the question whether women will finally lose the strong control they have over rice and, with it, their influence in rice farming.

Irrigation interventions should not encourage this process. If only men are consulted and recognised as farmers and irrigators, women farmers will lose their place as participants in the process of irrigation development. As a consequence, not only their participation in irrigation-related activities might be effected, but it could also lead to their losing control over the most important product of irrigation in Cambodia, which is rice.

In order for irrigation interventions to recognise women's labour and stimulate their participation, the following recommendations are formulated.

Recommendations:

1. Women should participate in projects as acknowledged farmers, instead of as wives of male farmers. Extra attention should be given to women to ensure that they are approached for information sharing occasions, whether these are consultations on irrigation structures or meetings on fertilizer distribution, etc..
 2. Any project or study should give special attention to what people say and what they actually do. Gender-sensitive field workers are essential to break through the boundaries of the established culture and moral codes and relate them to actual practice.
 3. Project identification should include an assessment of gender differences in technical knowledge.
 4. Women should be supported in their marketing activities. This could be done by:
 - *Informing women about the influences of national marketing on prices;
 - *Credit schemes in which women can choose to invest in marketing goods. (instead of limiting credit to agricultural purposes).
 - *Analysis of the constraints women have in marketing on a national and local (or context specific) level, related to the type of household and the economic situation of the women.
 5. To determine the impact of increasing cash flow on the position of women in the household, further research is necessary on negotiating processes within the household between :
 - women of different ages;
 - between in-laws;
 - between men and women.
-

9.2.2. Wet versus Dry season

The wet season rice varieties, whether irrigated or rainfed, are of extreme importance to Cambodian rice farmers. They have a long tradition, their eating qualities are appreciated most and are of less risk than the dry season crop.

Farmers participating in the study expressed the desire to have more control over the water supply during the wet season.

Besides the difference in male and female involvement in these two seasons, one needs to consider the desirability of a dry season crop.

The miracle of the dry season crop is a myth alive in the villages partaking in the study and amongst government officials. Farmers perceive it as a quick, high yielding crop which might alleviate their shortage and even provide a surplus in rice. Government agencies uphold the view that the dry season crop will increase rice production to such an extent that it will benefit the national economy significantly.

However, when discussing it seriously, men and women farmers are quick to point out its

disadvantages: capital intensive inputs, high labour demand and greater risk. The high yielding varieties demand a regular water supply and a sufficient amount of fertilizer which makes it a costly crop. Rats are a major hazard.

This crop is suitable for families who have the capital and the labour necessary, and can risk a crop failure.

Prey Sambuo in Angkor Borei might be an example of how a dry season crop can guarantee high yields and make its cultivation interesting for all socio-economic groups. However, its disadvantages are a high labour demand for the activities women undertake, particularly uprooting and transplanting and a dependency on pumps to get enough water at the right time in the field. Having to use pumps means dependency on petrol or diesel and sufficient knowledge for their maintenance and repair. Furthermore, women are discouraged from using pumps and often need to hire men to operate them.

The environmental aspects of taking annually inundated land into cultivation for a dry season crop need to be taken into consideration. The vegetation is cut down which brings increasing danger of erosion and which decreases the number of breeding places for fish. The crop cultivated on it needs fertile soil and thus must be used fertilizer with possible exhaustion of the soil, as a result. The natural flooding is curbed, changing the local, and probably the regional ecosystem.¹⁴ Farmers need to be informed on the pros and cons of dry season rice cultivation to be able to take sensible decisions on changing their cropping pattern.

14

Refer to Annex F of the Irrigation Rehabilitation study (Halcrow e.a, 1994) for a more competent environmental assessment.

Recommendations:

1. Before implementing irrigation rehabilitation for dry season rice cultivation the following questions need to be answered:
 - Should irrigation be the focus of rural development? If so:
 - Who has access (inter- and intra-household) to the necessary inputs to increase production?
 - Who benefits from this increase?
 - Who suffers from the increase?
 - What are the effects socially and environmentally?
 2. Men and women farmers need to be better informed on the effects of high yielding varieties, use of chemical fertilizers and pest control. Farmers discussions (men and women) could be organised where different experiences with the dry season rice cultivation can be compared and learned from.
 3. Extension on the pro's and cons of high yielding and traditional varieties is needed. Female farmers could be involved as experts on certain seeds.
 4. Villagers express the need for improving water management during the wet season instead of the dry season.
-

9.2.3. Resources

Labour and draught-animals are powerful resources. Households with few adults and no draught-animals need to generate income outside rice cultivation. Often these are young couples whose parents have no capital to share or female-headed households without children or with small children.

Water is not scarce nor do its sources have competing functions. Access to water is not decisive for socio-economic possibilities. Instead the means to get the water to the field such as labour, tools and information determine whether the household can make the water productive.

As both the tools and the information is less accessible to women, access to water does become decisive for gender relations.

The erosion of knowledge due to the harsh and destructive Pol Pot era has prevented the passing on of experiences and detailed know-how concerning local resources. Since the "liberation" women have been running the farms. They have been the continuous factor in agricultural development. They are therefore the source of knowledge on agricultural practices. This concerns seed selection, soil fertility, water management, etc.

Unfortunately, this knowledge is not tapped into as women are not considered farmers to be consulted. For both irrigation interventions women were not consulted at all. Male elders and leaders were approached. Women are losing control over the cultivation as water management on the system level is taken out of their hands. They are not encouraged to participate in decision-

making processes, they have no formal decision-making positions (village leader, canal keeper) and even the older men are consulted instead the older women. Today the women of around 40 years old, who have been organising and running their farms continuously for the last 10-15 years are the most knowledgeable on these issues. Most men have been gone either for several years or several months as soldiers or escaping recruitment, as students, or as migration workers.

Alarming is the consistent denial of access to education for daughters, curbing them in furthering their knowledge. Everything is done to give sons a chance to be educated while daughters are taken away from school as soon as they are considered capable of farm work or are felt needed for domestic chores. Perhaps this is a result of the apprehension felt by farmers of educated women who contest the norms and values and strive for political influence and change.

Recommendations:

-
1. Development agencies could develop legal support structures where men and women can obtain information and support. Issues could be title deeds, inheritance but also divorce and abandonment of women.
 2. Literacy courses and vocational training for women should be integrated into the project and the education of daughters should be given special attention.
-

9.2.4. Community organisation

Villagers expressed a total lack of confidence in collectivity. Even though they see the need for collective labour or decision making they are hesitant to take initiative. People do not easily trust each other and are reluctant to take responsibility.

I would like to rehabilitate the canal but I cannot do it "lonely". It is not easy to ask other people because together they are jealous. I can't ask the people but maybe the village leader can.
(Prey Sambuo)

How much their past, characterised by central control and absence of decision-making power, or Cambodian culture has led to these sentiments we dare not conclude.

In addition, there is a strong aversion to meetings. If one can be avoided, it definitely is. Only the older women confessed to enjoying meetings and regard them as social events. In Krang, men and women farmers consider the reduced necessity for collective decision-making as an important improvement.

As a result, organisation is only feasible when there is a clear and direct benefit. In Krang the water users association does not function as planned because the irrigated crop did not have their

primary interest. In Prey Sambuo, however, farmers organised themselves due to the importance of the crop. Limiting the costs of pumping and saving labour time were direct benefits for which they organised themselves. Nevertheless, constraints in organisation were readily given.

Women do go to meetings and participate, although not as easily as men. Women contribute labour for collective activities and do take initiatives. Clear and direct benefits for women, as for men, need to be defined when organising communities.

The Wats still have an organising function in raising money for schools or road improvements. The Wat also provides a communal meeting place. As well as the monks, the village leader is in a position to organise the people.

Any kind of community-organising activity should take the busy schedules farmers have into consideration. Male and female farmers are busy throughout the year in which rice production demands most of their time. Furthermore, during the day they have different time schedules. There are very few slack periods. If not much work in rice cultivation needs to be done, people will start growing vegetables, weave palm leaves, do petty trade or repair their houses. While men leave the farm to look for income elsewhere, women remain and combine farm work with off-farm income-generating activities. Thus, during the periods that male household members are gone, women have even less time to spare.

Community organisation could alleviate some of the hard work but at the moment farmers see it as a time consuming burden.

Recommendations:

1. Irrigation involves the collective use of water. This provides a starting point for farmer cooperation. As such, water can supply an organisational framework.
 2. Neighbouring field owners need to work together frequently. As such, they could decide to work together / be organised.
 3. For the organisation to work there must be the necessity to cooperate. Labour and capital are restricted resources around which farmers tend to organise.
 4. Development agencies should take a closer look at informal organisations to understand when they organise, which and whose interests they benefits and how negotiations take place.
 5. Development agencies should not only concentrate on men as knowledgeable farmers, but include women in all their activities.
 6. Village leaders are powerful men in a village. Perhaps development agencies could divert responsibility from the village leaders to other men and women. This might help in breaking through hierarchies. Giving responsibilities to women will improve their self confidence and recognition in the village.
 7. On a more national level development agencies could support government agencies and farmers in the debate on the possibilities and difficulties of water user groups. The scheduled workshop on community development and farmer managed irrigation systems could include a debate on differing interests between the farmers and the state. The papers written for the China Conference on this issue in September '94 could be adapted to stimulate the debate. Special attention should be given to the participation of women farmers to prevent the usual misconception that women are neither knowledgeable on these issues or involved in irrigation.
-

9.2.5. Female-Headed Households

The study shows that female-headed households are not disadvantaged per se. They can be found throughout the strata of socio-economic classes. The following factors seem to influence the well being of a female-headed household:

1. the age of the female head;
2. the age/number ratio of the children;
3. the presence of married children;
4. close relatives.

Without going into details here, one can deduce that adult labour availability is crucial for the well being of the household.

Several studies, however, argue that it is access to male adult labour which is the determining factor. (Ledgerwood,'92; Mehta,'93)

This study does not support this conclusion: if male adult labour is perceived necessary for

ploughing or other male-allocated tasks, this negates the fact that women do undertake these tasks in the absence of men or have alternative strategies to solve the problem such as exchange labour or hiring labour. The poor female-headed households lack labour in general. Wealthier female-headed households are able to arrange more access to male and/or female adult labour within and outside the household or through payment.

The impact of the four factors mentioned above is of more importance than the sex of the adult providing labour. Moreover, the interaction of the four factors determines the risk potential of the household.

In one particular aspect the category of female-headed households are disadvantaged per se: These women have no partner to support them in running the household, or to discuss possibilities and difficulties with. They have the sole responsibility for managing the household.

To conclude, female-headed households do not constitute a homogeneous category but certainly form a vulnerable category if there is little access to adult labour, many mouths to feed and few relatives to fall back on.

Recommendation

Gender bright targeting of projects in Cambodia needs to consider the different positions of women and not target blindly towards female-headed households.

9.2.6. Gender Education and Research

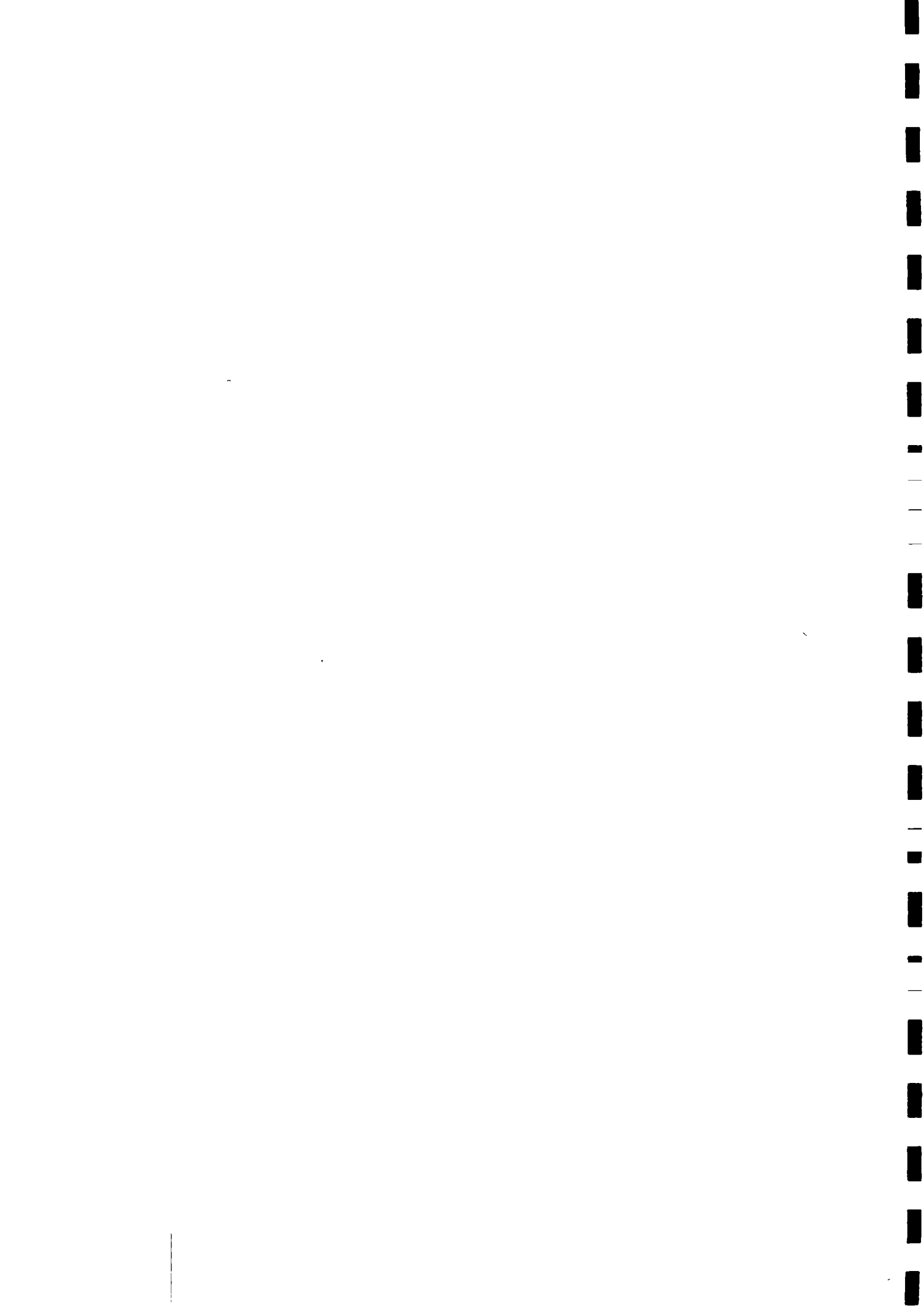
Gender awareness is increasing in Cambodia and numerous courses are available either in Cambodia or the surrounding region. However, less attention is given to training field of workers in gender-sensitive research or gender analysis. One cannot overestimate the complexity and sensitivity of gender issues.

It is recommended that development agencies invest in training their staff and field workers to understand gender relations in practice. Education facilities are necessary to allow local researchers to develop experience and conceptual understanding as well as to translate international gender debates for the Cambodian context. Cambodian institutions such as the University of Fine Arts, The Prek Leap Agricultural College, Cambodian Development and Research Institute could organise courses on:

- Gender and Development;
- Gender and Agriculture;
- Gender and Research methodology.

In addition to education, further research is needed. Ensuing from the study are the following themes:

- *Gender specific knowledge of agriculture. This includes varieties of crops, soils, water management.
 - *Traditional crop varieties and the reasons women have for growing them;
 - *Negotiating processes within the household;
 - *Women's participation and perspectives in rural marketing.
-



REFERENCES

- Ahlers, R.
1994 Why study Gender in Irrigated Agriculture? SAWA.
- Ahlers, R. & S. Vlaar.
1993 Gender Issues in Irrigation In Cambodia: a study proposal for the provinces of Takeo and Prey Veng. SAWA.
- Artifakto.
1990 Het Sociale van het Materiële: Een voorstel voor vakgroeps- en leeronderzoek naar de sociale inhoud van irrigatietechniek. Agricultural University Wageningen, The Netherlands.
- Boua C. & B. Kiernan
1989 Oxfam in Takeo. Oxfam, Cambodia.
- Boua, C. & B. Kiernan.
1987 Oxfam America's Program in Babong Village, Kampuchea. University of Wollongong, Australia.
- Bruins, B. & A. Heijmans.
1993 Gender Biases In Irrigation Projects: gender considerations in the rehabilitation of Baurahara Irrigation System in the District of Dang, Nepal. Nepal.
- Carney, J.A.
1988 Struggle over Land and Crops in an Irrigated Rice Scheme: the Gambia. In: Agriculture, Women and Land: The African Experience. Westview Press, Colorado.
- Feldstein, H. & S.V. Poats.
1989 Working Together; Gender analysis in Agriculture, Vol I&II. Kumarian Press.
- Fujisaka, S.
1988 Rice Agroecosystems, Farmer Management and Social Organisation in Kampuchea: a preliminary Assessment and Research Recommendations. Paper series no.136, IRRI.
- Halcrow e.a
1994 Irrigation Rehabilitation Study in Cambodia:Final Report.
Annex A: Hydrology
Annex E: Women in Development
Annex F: Environmental Assessment. Cambodia.
- Hart, G.
1991 Engendering Everyday Resistance: Gender, Patronage and Production in Rural Malaysia. Journal of Peasant Studies, Vol. 19 Oct. p. 93-121.
- Hulsebosch, J.
1993 Increasing Women's Benefits from Irrigation Development: Smallholder Irrigation in the Kano Plain, Kenya. Network paper no.24, ODI
- Illo, J.F.I
1985 Women's participation in Two Philippine Irrigation Projects. Philippine Sociological Review. No.33.

- Kabeer, N.
 1992 Triple Roles, Gender Roles, Social Relations: The Political Sub-Text of Gender Training. Discussion paper 313, Institute of Development Studies, Sussex.
- 1994 Gender-aware Policy and Planning: a Social Relations perspective. keynote paper 2, IDS, Sussex.
- Kuiper J. & H v. Zeijts
 1989 Farmer Participatory Management in Kampuchea: a New Concept in Irrigation Management. SAWA.
- Lando, R.P & M. Solieng
 1990/91 Baseline Survey Reports 1-4. IRRI-Cambodia Project.
- Ledgerwood, J.
 1992 Analysis of the Situation of Women in Cambodia: Research on Women in Khmer Society. UNICEF Cambodia.
- Linden, A.M v.d.
 1989 Situation Sketch on Water Management in the Floodplains of Cambodia. SAWA.
- MCC
 1992 Farmer Participation in Irrigation WPDevelopment, MCC Prey Veng irrigation Project. FPID Newsletter, Cambodia.
- Mehta, M.
 1993 Gender Dimensions of Poverty in Cambodia: a Survey Report. Oxfam. Cambodia.
- Mysliviec, E.
 1988 Punishing the Poor, the International Isolation of Kampuchea. Oxfam.
- Paris, T. e.a.
 1992 An Assessment of the Economic Contribution of Women in Rice Farming in Cambodia. IRRI. The Philippines
- Roberts, M.
 1992 Farmer participation in Irrigation Development, A Community Organiser Approach; A Proposal for Prey Veng province, State of Cambodia. MCC, Cambodia.
- Russo, S. e.a.
 1989 Gender Issues in Agriculture and Natural Resource Management. USAID.
- SAWA
 1993 Gender and Irrigation, a manual for planning and assessment of small scale irrigation projects. SAWA.
- Smout, I.K & P. Robertson
 1993 Takeo Irrigation Structures, Cambodia. Evaluation of Oxfam Project KAM 215. WEDC, Leicestershire, England.
- Sonnois, B.
 1990 Women in Cambodia: Overview of the situation and suggestions for development programmes. Redd Barna, Cambodia.

Tarr C.M.

1992 From Welfare to Empowerment: Policy Approaches to Low Income Women and Gender Planning in Post-Socialist Cambodia. Australia.

Than, S.

1982 Alternative Strategies of Irrigation Development in Cambodia. Cornell University.

White S.

1993 Arguing with the crocodile: Gender and class in Bangladesh. The University Press Ltd. Dhaka.

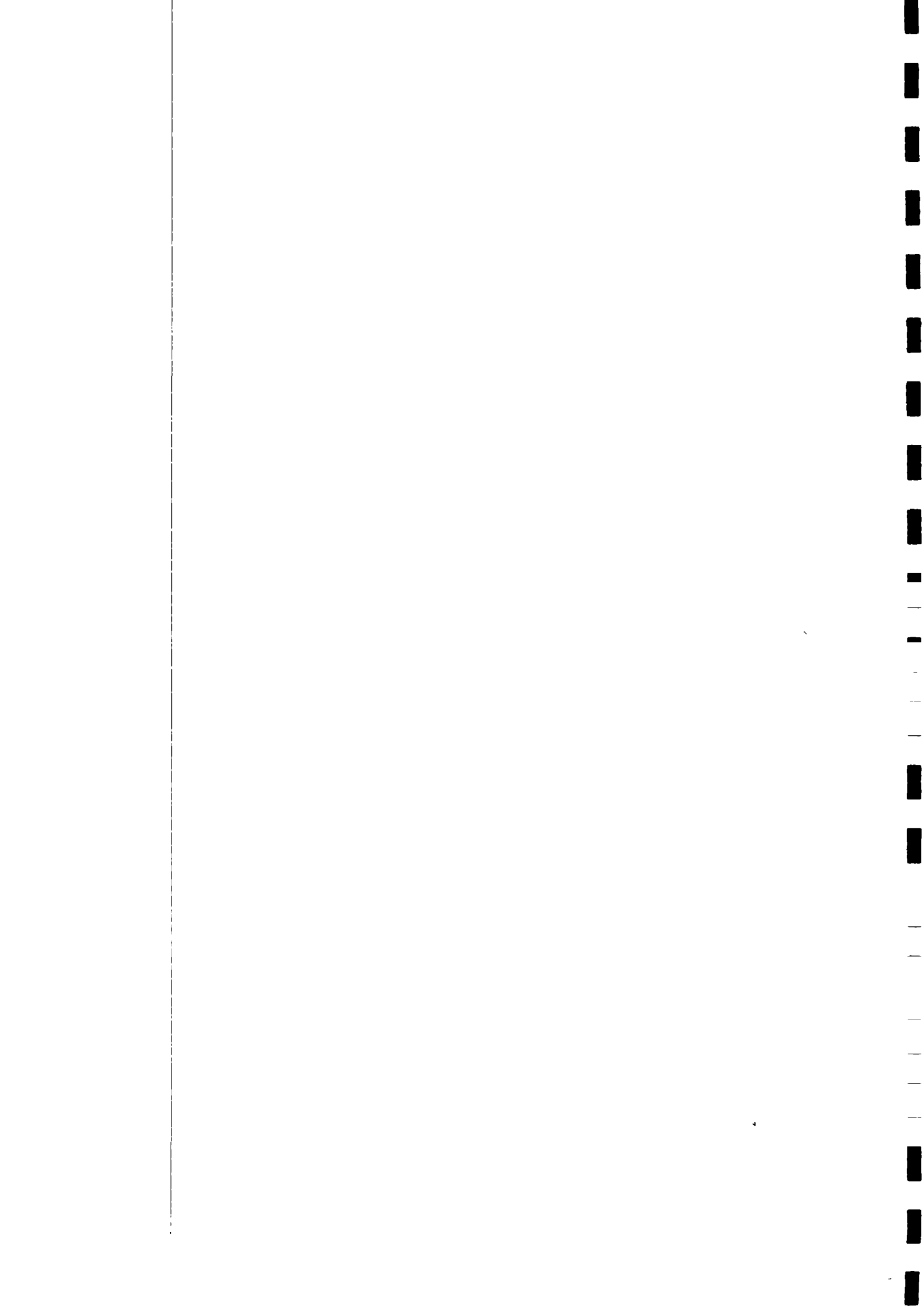
Yoder, R.

1992 Report on Cambodia Consultancy for Mennonite Central Committee.

Zwarteveen, M.

1994 Gender issues, Water Issues: a Gender Perspective on Irrigation Management. Working paper no.32, IIMI.

1993 Some suggestions, tools, concepts and guides for data collection for gender analysis in irrigation. WPWPCCOM



Annexes

Annex 1	Specific objectives of the study	1
Annex 2	Geographical maps:	
	2A: Cambodia	3
	2B: Takeo province	4
	Layout Intervention	5
	2C: Prey Veng province	6
	Layout Intervention	7
Annex 3	Selection criteria for the villages	8
Annex 4	Selected PA-methods	9
Annex 5	Historic time line	11
Annex 6	Short description of each village	12
Annex 7	Area and production figures for rice cultivation in Cambodia	20
Annex 8	Daily timelines	21
Annex 9	Land ownership	23



The specific objectives of the study.

1. General

- 1.1 Give a socio-economic overview of the farmers in the survey villages. Investigate the relationship between poverty and type of household, the land ownership, land use, land quality, distance of land to the houses, different sources of income in cash and kind and the existing formal and informal structures in the village and with the commune.
- 1.2 Describe the access to and control over means of production, services and facilities:
Do women and men have equal access to , control over or use of:
 - land and water
 - credit, capital
 - implements for production, post harvest uses
 - agricultural inputs
 - transportation
 - technical support
 - training

2. Participation in decision-making

- 2.1 Investigate how and when men and women are involved in decision making and planning of farm management at household level and community level.
- 2.2 Investigate if men and women are organised in formal or informal farmers groups or water-users associations. Are these independent, government or NGO administered? Investigate how the functions of men and women in these structures are organised and how they perceive the differences between the different forms of organisation.

3. Labour

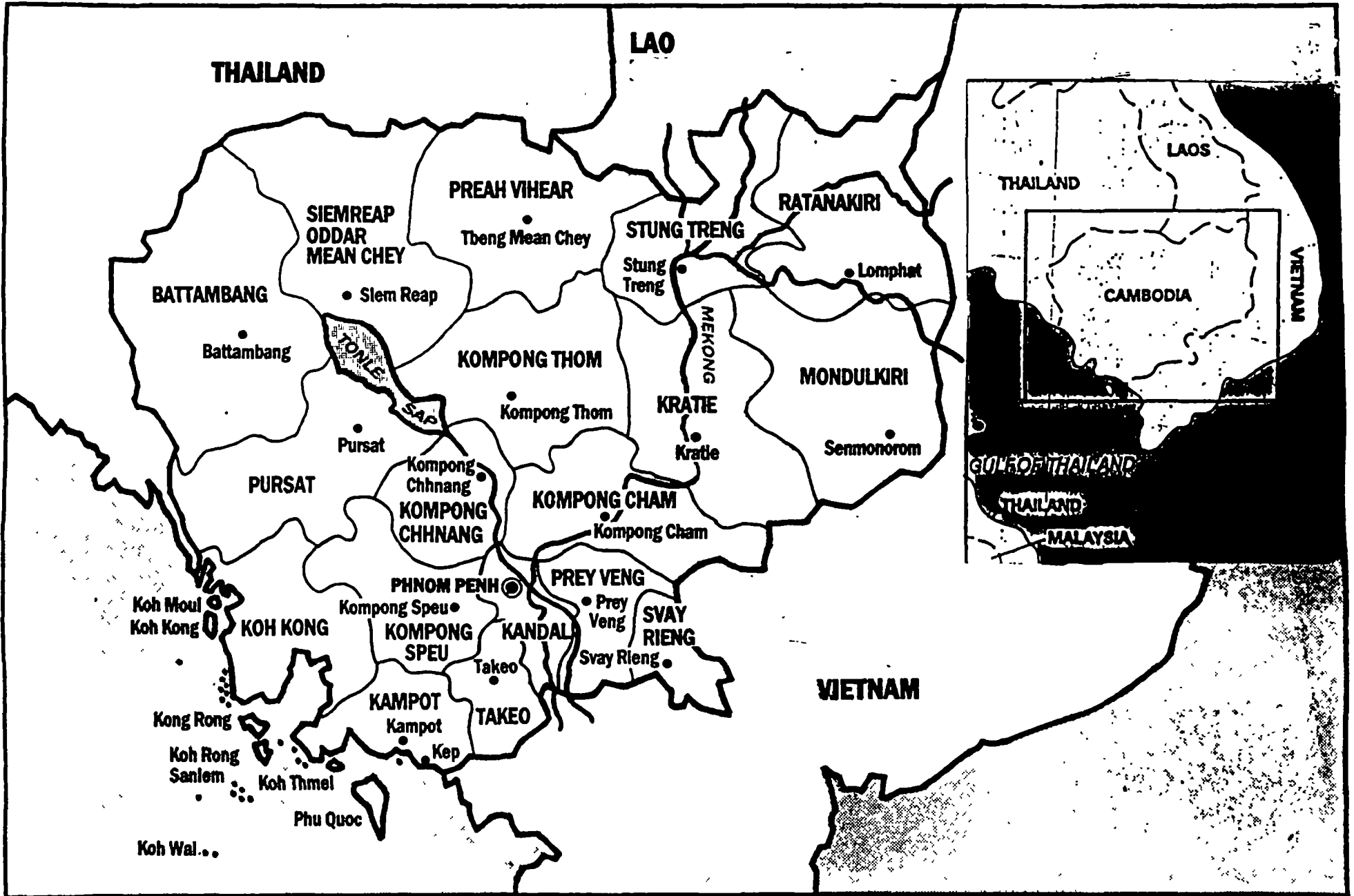
- 3.1 Identify involvement and workload of women and men in:
 - all stages of the irrigated agricultural production process;
 - all stages of the irrigation process;
 - off-farm labour, non-farm labour, housework and child care.
- 3.2 Assess the workload of men and women in terms of working hours, physical demands and importance for family well being. Analyze the role of children in the household.
- 3.3 Investigate the seasonality of these activities
- 3.4 Analyze if there is a significant difference in workload for women in the different types of households.
- 3.5 Analyze if there is a difference in workload for women and men in poorer households when comparing with better off families.
- 3.6 Assess to what extent men and women in couple-headed households may take over from each other in times of hardship and work pressure or because certain activities have become more profitable or involve technological innovations.
- 3.7 Investigate if women are mainly paid or unpaid family workers, wage labourers, own account producers, providing labour exchange or any combination of these.
- 3.8 Investigate the exchange labour arrangements and what wages are paid to men and women.

4. Irrigation

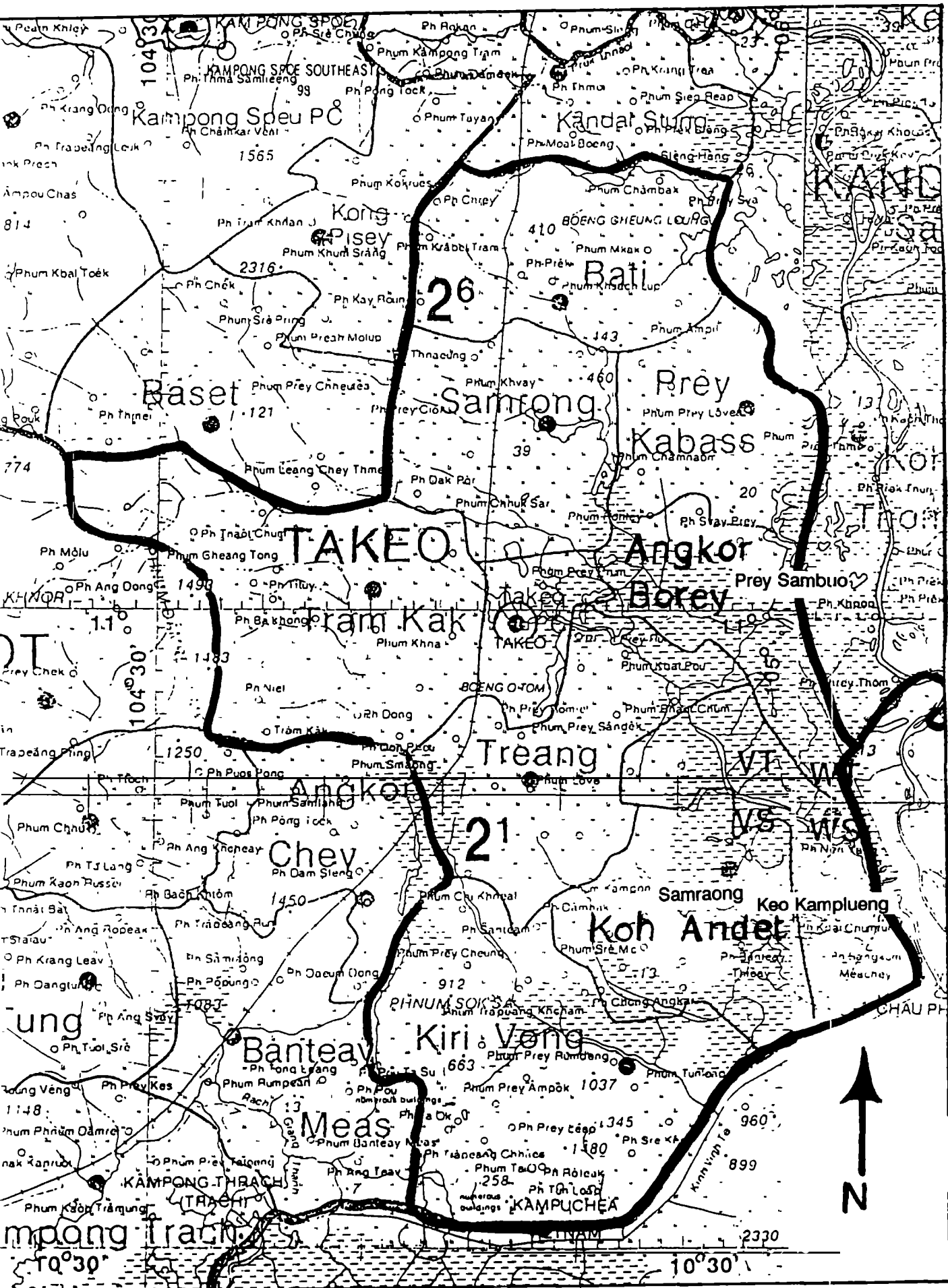
- 4.1 Analyze the different rice growing practices and irrigation methods used with respect to men's and women's interests, knowledge, preferences, roles and responsibilities.
- 4.2 Investigate how and when men and women are involved in the planning, construction, implementation, maintenance and operation of the irrigation schemes and structures. What is their perception on their involvement in the future.
- 4.3 Investigate whether the irrigation infrastructures are user friendly for women.
- 4.4 Investigate how the change from floating rice growing to flood recession rice growing (with and without supplementary irrigation) effects the workload of women, men and children and how households cope with this change.
- 4.5 Investigate what men and women perceive the effects to be of the availability of irrigation on their workload, differentiating between the different types of households and the socio-economic position of farmers.
- 4.6 Investigate whether female-headed households like to change the crop system from floating rice to flood recession rice. Are they able to do so or would they prefer other ways to improve their living conditions.

5. The intervention

- 5.1 Give a short description of the actual situation of the irrigation intervention in the survey area:
 - * policy and objectives;
 - * target groups;
 - * history of the intervention;
 - * internal and external organisational structures, including farmers organisations, Water-users Groups and involved government structures.



CAMBODIA



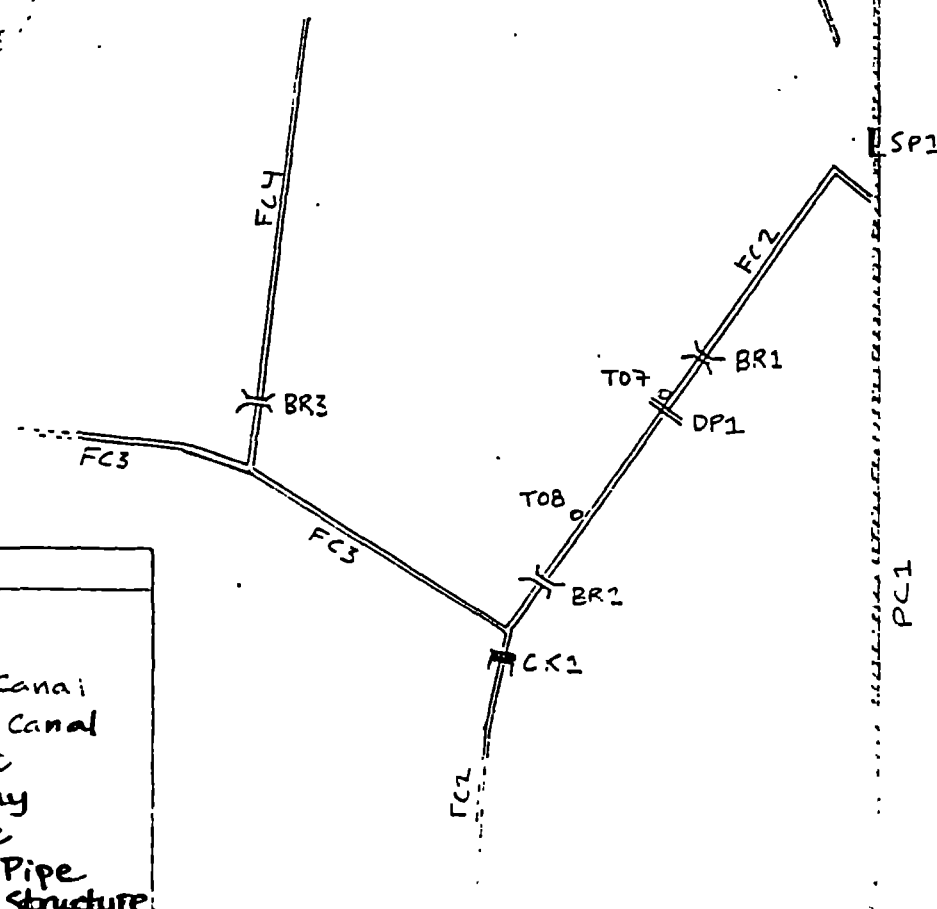
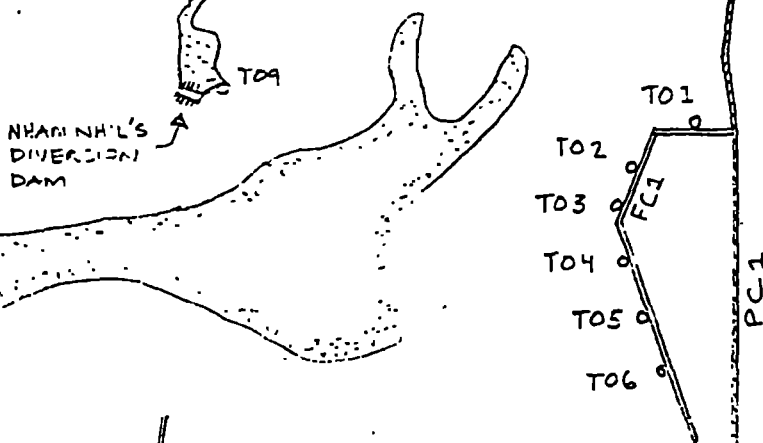
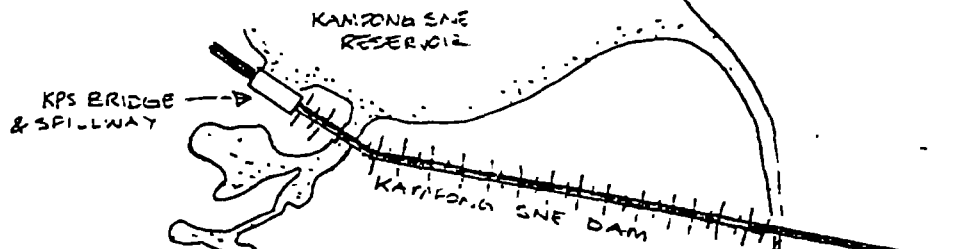
Takeo Province with the villages Prey Sambuo, Samraong and Keo Kamplung.

Toap Sdach

Krang

Po Pluk

NORTH



LEGEND	
	Road
	FC Pol Pot Canal
	FC French Canal
	TO Turnout
	SP Spilway
	BR Bridge
	DP Drain Pipe
	CK Check Structure



Selection criteria for the villages

In order to be able to choose appropriate sites in both provinces the following selection criteria have been defined.

1. The security situation.
Security should not be a constraining factor to travel freely during the day and allow the team to conduct the study in the village.
2. Overnight stay.
The possibility of staying overnight whether in the village itself or in the district town. Staying overnight in the villages would reduce the time necessary for travel considerably. Furthermore, it allows for more interaction between the team and the villagers on an informal basis.
3. Accessibility by road.
The district town must be accessible by road and the village might be reached by car if necessary. Apparently the accessibility will be different during the wet and the dry season. Therefore, the villages studied during the second phase, when the wet season has begun, need to be screened by this criteria more carefully.
4. Rice growing practices.
In phase 1: For Takeo, a wet season crop and a floating rice crop must be grown in the same village. A wet season crop and a floodrecession crop without community or ad hoc irrigation on farm level must be grown in Prey Veng in the same village.
In phase 2: For Takeo a wet season crop and a flood recession rice crop, which has developed from a floating rice crop. For Prey Veng, a wet season crop and the extension of the area where flood recession rice is grown.
5. The irrigation intervention.
The irrigation intervention studied in the second phase should be an intervention on NGO-level. The irrigation intervention should be one which NGOs perceive as having potential at this point in time. For example, one they may implement themselves.
6. Presence of different types of households.
The different types of households mentioned in the objectives being the couple-headed, female-headed de facto and female-headed de jure, should exist in the village.
7. Village composition
Villages to be studied should not be atypical in the sense that for example, a village is entirely composed of returnees or inhabited mainly by one of the ethnic minorities.
8. Presence of migrating labour.
Not the migrating labour itself is of interest to the study but the influence of it on household decision-making processes and on the agricultural production.
9. Fishing
No significant social conflict between fishermen and rice farmers should exist in the villages studied. Even though this might be interesting to investigate, it would mean an extra topic within the study. However, the issue of rice farmers involved in fishing will be touched upon when present.
10. No obvious social and agricultural relationships between the households of villages of phase 1 and 2.
11. Village size
Villages should not have less than 60 households and not more than 200. Preference lies with a village with roughly a hundred households, based on village organization.



Information about selected PA methods

1. MAPPING

Villagers are asked to make a map of the village lay out. Maps can be drawn either on paper or on the ground with e.g. paint powder. Some of the different uses of mapping are: village social mapping or resource mapping.

Mapping is useful to identify resources, socio-economic differences , differences in perspectives and interests and to promote exchange of views.

Several maps can be drawn to explain different aspects of the village.

2. MATRICES

Matrices provide a possibility to compare practices with priorities and to understand why people do what they do and what is important of certain practices. The criteria might be different for different groups. Women might have different criteria than men.

Any subject can be chosen which is important to the villagers e.g. rice varieties, different income earning activities, different crops, water sources.

3. TRANSECT WALKS

These are systematic walks through an area either following a particular course or covering the area.

Villagers can present and explain their social or agricultural organisation in detail and on the spot. By doing transects, the study team can gain an idea of the area, of the organisation and of possible bottlenecks or conflicts.

Together decide which transect is most interesting and useful. It might run from north to south or from high to low as long as it represents the topography, vegetation, water sources, different soils, etc..

4. SEASONAL CALENDERS

This is the presentation of variations during seasons. This can be done either on paper or on the ground, with the help of sticks, leaves, seeds etc.

It gives insight in cropping patterns, division of labour, labour demand and availability, water availability, income spending and problems. It helps put all kinds of different information in one picture linked to time. Furthermore, it can generate discussions and be used as information source for setting up matrices.

5. SURVEY INTERVIEW

Surveys give answers to the **how much** question. Therefore, they should be done carefully and accurately to be able to give good statistics. The questions are often predetermined and the order of questions and topics is fixed.

6 SEMI-STRUCTURED INTERVIEWS

The purpose of the interview is to collect information from a cross section of households, to discuss and to better understand intra- and inter-household relations in an informal and conversational way. Only some questions are predetermined.

7. LIFE HISTORIES

Life histories are the documenting of a person's life story.

Life histories are done by persons who are older or have led a typical lives. In Cambodia, old persons in the village who have lived there all their life can explain how the village developed. A returnee can share her/his experience on the impact of migration.

8. VENN DIAGRAMS

People are asked to draw a central circle to represent themselves and other circles representing groups and institutions with which they have relations. The distance to the central circle indicates the strength of the relation, while the size of the circle shows their importance to the people. Circles can overlap.

9. RANKING

This method allows field workers to understand quickly the nature of wealth or well being differences between households in a community and to determine the approximate wealth status of each household.

"Wealth" in this study is not limited to the financial situation of the household but refers to a general socio-economic well being of the household.

The method starts with writing the name of each household on a card. The cards are then ranked from low to high wealth status by a small group of people.

In the process of sorting the cards, and verifying the groupings, the informants will be constantly thinking about wealth differences. After the sorting has been verified, the field worker tries to discuss in greater detail the nature of the differences between people of different wealth ranks.

Sometimes it turns out to be too sensitive to ask about specific households.

In this discussion, the respondents identify the factors which define wealth differences within the community and how wealth affects various aspects of life and production.

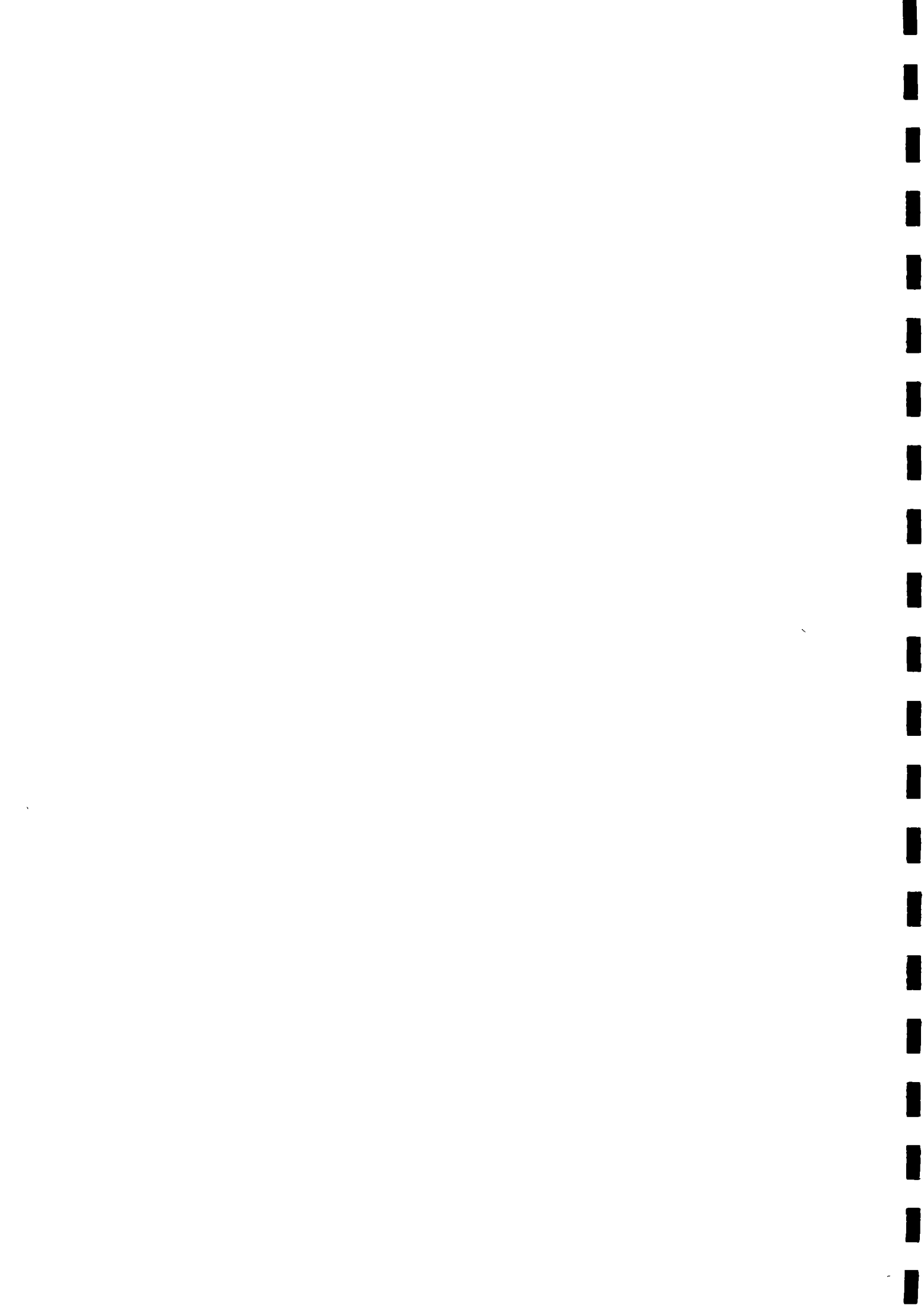
10. DAILY ACTIVITY TIMELINE

An activity profile identifies all relevant productive, reproductive and community activities of an individual or a group and may also indicate the time, frequency and location of work. information is gathered from different groups of men and women on their activities: what is done, when, how long does it take, how often and where.

Historic time line

- 1953 Independence of Cambodia from the French.
- 1954 Geneva conference on Indochina recognises Cambodia's neutrality.
- 1969 US bombing of Cambodia begins aimed at Vietnamese base camps.
- 1970 Sihanouk is overthrown in a coup by Lon Nol.
- 1972 2 million Cambodians made homeless by war between Lon nol and the Khmer Rouge.
- 1973 End of Vietnam war; massive bombings by the US.
- 1975 Khmer Rouge enter Phnom Penh and Pol Pot era begins.
- 1979 Vietnam captures Phnom Penh and Khmer Rouge are driven to Thai Border. Heng Samrin becomes head of People Republic of Kampuchea. Aid effort to Kampuchea begins.
- 1982 Coalition formed between Sihanouk and Khmer Rouge. A civil war rages.
- 1989 Vietnamese troops leave Cambodia
- 1991 Paris peace Treaty is signed and preparations for elections to be held in 1993 begin.
- 1992 The UNTAC peace keeping force arrives to prepare and guide elections and disarm the Khmer Rouge.
- 1993 A Vietnamese village is massacred by Khmer Rouge. Elections take place. The Khmer Rouge decide at the last minute not to take part. The royalists led by Sihanouk's son Ranariddh, win the elections by a close margin. A coalition government is formed with the former government party, the CPP. Ranariddh becomes first Prime Minister and Hun Sen second Prime Minister.
- 1994 Fighting in the North West of Cambodia increases. The Khmer Rouge is outlawed. A coupe takes place but fails. Khmer Rouge starts kidnapping foreigners for ransom. The foreigners end up getting killed.

Adapted from Mysliwicz, 1988 and added to.



A short description of each village.

Toap Sdach, Prey Veng (no intervention)

The village has a male village leader who has been in function since 1984. The village is divided into kroms. A few of the krom leaders are women. The Wat plays an insignificant role in Toap Sdach.

With the help of the wealth ranking exercise the village was divided into four groups: rich, middle, next poor and poor. The following criteria determine the socio-economic position of a household.

1. Access to cash or capital to invest;
2. Draught-animals in relation to labour availability;
3. Rice produce
4. Land ownership

In Toap Sdach the cash economy and access to it is becoming increasingly important. Rice is no longer structuring the economy. A reason for this is the land shortage and the solution villagers have found in migration labour, introducing large amounts of cash in the community. Draught-animals are perceived as an essential capital good, as due to being a requisite for any cultivation. Wealth is concentrated in a small category who have capital to invest in land or business ventures. Source of capital for the richest group is pre Pol Pot wealth having been invested with good economic returns. The middle group is characterised by having access to a steady flow of cash. The next poor group are primarily farmers who grow just enough rice to last them until the next harvest. They earn some cash through selling pigs and labour to pay for the lack of draught-animals. The poorest group is far removed from the other three. They have a shortage of rice for 6 months or more, are usually in dependency relations through borrowing or "boling" of rice from middle and rich households. They lack necessary means to cultivate it. Especially the combinations of lack of labour and draught-animals proves to be problematic. Several households in this group have sold their land to the rich and middle households.

According to the villagers, households could improve their socio-economic situation if they have labour to sell through wage labour on other farms or migration labour elsewhere. This is especially interesting for next poor households. For the poorest group the only solution people could think of was to improve their access to draught-animals.

Female-headed households (FHH) are represented in all groups. Even though more FHH are found in the category of the poorest, one cannot use the fact that the household is headed by a woman as an economic indicator. In fact, many couple-headed households were defined as headed by women. Of the 23 couple-headed households asked in the survey, 13 (56%) were said to be female-headed. Of the 52 households, including de facto and de jure female-headed households, 28 (54%) were said to be headed by women and 5 (10%) by both. (69% of respondents were women, 31 % men)

For both men and women respondents the most common criteria for determining who is the household head was: the person who is responsible for everything (taking care of the household and earning money). Women often said that they have to do all the thinking.

WOMEN, a short anecdote

Traditionally, when the women start menstruating they have to stay in the house for several months. The richer you are, the longer you must stay inside. Rich people keep daughters for longer than a year inside the house. They can bath at night. They cannot eat beef, pork and salt fish. They cannot get married until one year has passed after being able to leave the house.

Po Pluk, Prey Veng (no intervention)

Po Pluk is a small village, whose village leader is not very influential. The monks of the Wat and the Watkeeper, however, play a leading role.

The Wat in Po Pluk serves four villages of which Po Pluk is one. It houses about 4 elderly monks and a few young trainees. The Wat had been destroyed by Lon Nol's bombing in the early seventies. Apparently, Lon Nol's soldiers believed that the Wats were hide outs for revolutionaries. Since "liberation" (1979) the village has been saving to fix it. In 1993 rehabilitation works began. Donations from Cambodians in the United States were substantial. The new school building was also donated by the immigrants.

The Wat keeper was unanimously voted the richest man by all the participants in the wealth ranking exercise.

The wealth ranking exercise resulted in the following criteria determining socio-economic differentiation:

1. landownership based on area of dry season land
2. draught-animals
3. labour
4. capital to invest

The possibility to increase dry season land in Po Pluk is linked to family history and available access to the resources labour, cash, knowledge (how much land is left to clear and who is influential). The possibility for many households to grow a dry season crop and even increase their land area has boosted their economic situation and has allowed them to profit from those with less land through "boll" and labour relations. The richer and middle are characterised by having larger areas of chomlok and dry season land.

The possession of draught-animals after Pol Pot gave extra landownership and, as in Toap Sdach it is a valuable capital good (exchanged for labour or cash).

Exchange labour is a common feature in Po Pluk and quite a few kroms still exist as labour pools. The ownership of draught-animals determines the economic differentiation within these kroms as twice the amount of labour time has to be exchanged.

Surplus rice, access to dry season land and labour has allowed households to accumulate capital with they have started to invest in for example pig raising, rice dealing and other business ventures.

While the richer households are primarily farmers with additional business activities, the middle group is characterised as being farmers with a salary to supplement their rice crop. The men are either teachers, doctors or district officials. Most "boll" relationships are with the middle households.

The next poor and poor group have in common that they do not produce enough rice to eat for the whole year (three and six months or more short respectively). In general this is due to lack of labour. The poorest group are often young couples, households with illness in the family and tied to a dependency relationship through "bolling". The poorest households have less access to land, draught-animals and labour and need only one calamity (low yields, illness) to become totally depended on other households through "boll" or they decide to sell their land.

Every respondent perceived an increase in land size as the way to improve a household's socio-economic situation. To do so a good relationship with the irrigation association representative was important as he was said to be the only one who knew how much land could be cleared.

Furthermore, sufficient labour would be essential. Middle households could increase their wealth by investing their money while poor households were perceived as being doomed to stay poor.

As agriculture is a profitable activity, less migration takes place and men are far more involved in agriculture than in Toap Sdach. The women are involved in the more traditional activities having

less control over the agricultural production process in comparison. Their decision making power and their knowledge of agriculture is decreasing in inverse relation to their economic status.

Samraong, Takeo (no intervention)

The village leader is quite a wealthy man in the village but very much appreciated by the villagers in comparison with previous leaders. Together with the keeper of the mosque, he is responsible for running the village. Villagers are obliged to yearly contribute a certain amount of rice to the mosque. The mosque also serves as a school where Khmer classes are given in the morning and Arabic classes in the afternoon.

Being a minority group and discriminated as such in Cambodia, the social structure of the village is very tight. The team members were surprised by the solidarity they encountered among the villagers in Samraong.

The following criteria determine the socio-economic situation of a household according to the villagers.

1. Investment/Business
2. draught-animals
3. labour
4. Landownership

The richer households are characterised as being more involved in non rice farming activities such as breeding and selling oxen and ducks. Their investments are said to have been made possible with pre-Pol Pot wealth. The middle group is involved in a multitude of activities of which rice farming is an important one. They produce enough rice throughout the year unlike the other categories. Even the richer households often have rice shortages which they compensate by their income-generating livestock activities. The next poor group is characterised by a lack of draught-animals, not enough rice and families with many children. The poorest group involves households with lack of labour, no draught-animals, large families with young children and little or no land.

Rice yields are generally very low in the floating practice and only interesting when land areas are very large. Yields are less than 1 ton/ha. A household with limited land and lack of labour can survive as long as the community is willing to lend them rice or money without interest. In Samraong borrowing with interest is said to be against their religious laws. However, at one point when too many debts accumulate, a dependency relation is created with Chinese merchants residing in Koh Andet.

Limited amount of higher land is one reason for households becoming involved in indebtedness with money lenders in Koh Andet, especially when there is lack of draught-animals and labour in the household.

Draught-animals are very important because they can plough, produce calves to sell or raise to hire out. If you cannot hire draught-animals you must wait until everybody is finished and the animal is rested. This is because cash is preferred above exchange labour. (wealth ranking discussion Toul Nekta)

The exchange rate for hiring draught-animals is exceptionally high in Samraong, one morning ploughing costs 5000r. In labour exchange terms it is two days transplanting for one morning of ploughing.

Mobility between groups is limited. Villagers tell us that there can be movement with the help of duck raising and cow breeding but this takes a long time. The poor families were not given much chance to improve their situation. Their situation is considered only possible to get worse. Everyone agrees that it depends on the amount of non productive children in the household.

The amount of children seemed to be an important criteria for everybody: too many mouths to feed. In Samraong, 58% of the population is below 16.

People have so many children because women are married at 16. When they are 20 they have 3 children, when they are 30 they will have 9 and when they are 40 they will have 12, maybe 13! (idem)

Large families were common in Samroang, several couples interviewed had more than 13 children. When discussing this with women there seemed to be very little knowledge on contraceptives, western or local.

Keo Kamplueng, Takeo (no intervention)

Keo Kamplueng has a male village leader chosen by the district authorities. He was a leader from 1983 until 1986 when he asked permission to give the leadership to someone due to personal problems. In 1988 he was approached by the authorities to once again take up leadership after the villagers had complained to the district about his successor. He did not want to be village leader again, but after having experienced Pol Pot time when they brought in leaders from elsewhere to control the village, he decided that as he was born in Keo Kamplueng, he had a duty to be its leader if there was no one else.

The importance of the Wat in Keo kamplueng is similar to Po PLuk. Poor families send their sons to work and study at the Wat for several years.

The following criteria determine the socio-economic position of the household:

1. Livestock
2. landownership
3. Rice production /stock
4. Off farm earnings

Livestock in Keo Kamplueng is of utmost importance as it ensures access to other resources. This is due to the lack of exchange labour. If a household does not have a family member to plough the field and cannot afford a tractor it cannot exchange labour for the draught-animals but has to exchange land. Not having access to draught-animals can lead to losing access over land.

Draught-animals are important because land is exchanged for draught-animals. That is the reason why the poor are poor. (respondent next poor)

Richer families have several oxen and cows and are characterised by having claimed livestock as well as oxcarts and tools after Pol Pot time. While the poorest households are said to have inherited nothing besides land.

Forest has been cleared by households with enough labour. Land can also be exchanged for loans. The impression exists that land is not easily sold but rather lost through loans which could not be paid back. These loans are often not in relation to the production potential of the field. Poor households lend out their land for a small amount of cash far less than the value of the crop harvested on it.

While the richer households are involved in breeding and selling livestock, selling rice and other income-generating activities such as rice mills or video halls, the middle households are characterised by having a government salary in combination with enough rice production. These households are usually involved in pig raising to supplement their income. The next poor households are farmers who supplement their rice shortage (4-6 months) with fishing or rowing passengers to Koh Andet. The poorest families are those who have lost most or all of their land

through debt relations with fellow villagers or chinese moneylenders in Koh Andet. The chinese moneylenders are involved in lending grocery goods or money against rice. At harvest time they hire villagers to collect the rice.

When they come to collect, there is a lot of fighting! (chh.next poor)

These poor families survive by doing wage labour. The soldier households are found in this category.

Mobility between groups is perceived possible through pig raising and making and selling of mats. Especially the latter is an important activity with grass abundantly available on the floating rice land before the floods. However, these are not within reach for the poorest households due to lack of labour and money to invest in pigs or paint.

Keo Kamplueng, lying so close to Vietnam has access to cheap Vietnamese labourers. In December Vietnamese men and women come to the floating rice fields to harvest the extensive areas of floating rice.

People in this village do not like to harvest the floating land and there are many Vietnamese sitting in the fields, waiting. They are organised in groups with leaders. I negotiate with the leader and pay 3 taol/khong to the leader. (woman)

The leaders work with the others and together they live in the fields until all is harvested. This abundance of cheap labour available has made labour exchange less interesting.

As floating rice is the main crop and the rice grown on the higher land is broadcasted as well, transplanting is not usually done which could also explain the lack of labour exchange. It also means that women are far less involved in agriculture, floating rice being regarded as a male crop. Men say that women cannot work in the floating rice crop and that transplanting is not as difficult or as hard work as broadcast sowing. There is a definite lack of regard for women's work. The village leader says that women are lazy and only do small things at home.

Female-headed households are heavily dependent on their male family relations as not much pioneering of women in male activities takes place. With women not controlling draught-animals nor the agricultural production, they are left in a vulnerable situation. The impression is that they are more involved in the cash economy with selling mats, pig and cow raising. However, the accessibility of markets is difficult due to Keo Kamplueng's isolation, hindering their possibilities.

Krang, Prey Veng (Intervention by MCC)

The village leader was appointed by the district in 1987. Since the elections, however, things have been very unclear. He did not know until a few months ago that he was still in function.

There was no communications with the Khum or Srok for almost one year. During that year everybody was very uncertain, everything felt temporary. Now things have gone back to normal. (village leader)

The Wat also has a central function in Krang but more in a religious sense than community organisational sense. Many women go to the Wat daily to bring food and meditate, while many men read their "buddhist scriptures" every evening.

The village seems quite wealthy and when doing the wealth ranking, the respondents agreed that except for the poorest group, the groups are close together in wellbeing. There are far fewer destitute households in Krang if compared to Po Pluk and Toap Sdach (only two as far as we know). Most (except 5) households have draught-animals which the team found quite remarkable. The villagers told us that an organisation had come to the village to organise rice banks but that they were not interested as only few households suffer from rice shortage. The houses are made

of wood and the majority have tiled roofs. Many families have children working or studying in Phnom Penh or Prey Veng. Phnom Penh is an important cash source for Krang and recipient of rice from Krang.

Criteria defined by the wealth ranking respondents were:

1. Cash source beside rice cultivation
2. Landsize and type of land
3. Labour
4. Rice stock

The team also gave a set of criteria:

Rich: work with gov; many income sources; big farm (relatives of village leader, know families who left Krang and took over land); can buy fertilizer, pesticide against rats and hire pump.

Poor: no draught-animals; only grow rice; illness in the household; small size of land (no connections; small family at the time of distribution; husband at distribution in the army, no cash to bribe measurers)

Depending on the size of the land and the type and quality of it, surplus rice can be produced in such amounts that it is worthwhile selling as an income-generating activity. Large areas of Chomlok land or wet season land which can be supplementary irrigated can provide reasonable yields**note so much per ha** Another factor concerning land is whether land has been divided for children who marry and set up their own household. The division of land cause the families to cultivate smaller pieces with less labour and naturally less yield. Often these yields are no longer enough to sustain the household.

The rich families have access to several different sources of income besides rice such as government salaries and business ventures (rice dealing, party furniture, larger grocery shops). The middle families produce enough rice (enough land) and have small business such as moto driver, pig raising or migration labour. The next poor household have less land and do not always produce enough rice to eat. These families often have men do migration labour to supplement the households income. The poorest families lack labour. They lack labour for farm work and can hardly afford household members to leave for migration labour unless all the land is sold. These households have a rice shortage for 1-3 months.

In general, shortage of labour is limited to only a few households. The exchange system exists but not everybody makes use of it for different reasons. As most families have draught-animals, there is little exchange for ploughing, this includes female-headed households. Labour seems to be the way of creating dependency relations. Free labour as such does not seem to exist. If you work for someone without asking anything in return it contributes to your network of contacts you can fall back on in times of need. The reverse happens as well.

Migration labour is important in Krang. Mostly men go as cyclo or moto taxis to work in Phnom Penh. A few women in krang go as well. As far as we know there are 5 women who are either single, widow or married to a soldier. They go to Phnom to sell vegetables or construction work and have relatives to stay with.

"We cannot solve our own problems."(village meeting)

Prey Sambuo, Takeo (Oxfam intervention)

The village leader of Prey Sambuo is the fourth elected by the district since 1979. The first was accused of spying, the second of taking bribes and the third of molesting young women. Finally, the district chose the present village leader even though he was village leader during Pol Pot time (in Koh Kong).

The Wat in Prey Sambuo was well populated by young monks and headed by a fairly young monk (27-28 years of age). The Wat had its own piece of land which is cultivated by elderly men and women who in return can eat with the monks. The monks have little influence on the village community and only the elderly frequent the Wat on special days.

The following criteria were formulated to determine social differentiation in Prey Sambuo.

1. Cash sources
2. landownership (dry season)
3. draught-animals
4. labour

Prey Sambuo is a village which generates large amounts of surplus rice. Especially the DS land which is of a far larger area than the WS land produces high yields of over 4 tonnes/ha. In combination with this there seems to be a fairly good link with a rice depot close to Phnom Penh in Kandal province. This allows for surplus rice to be marketed and it allows the dealing of rice to be an income source for the villagers which is not restricted to better off families. However, due to fluctuating rice prices some villagers having invested everything in buying up rice and the necessary transport can easily go bankrupt. These families need cash throughout the year and cannot wait for better prices.

Families that produce surplus beyond what they need to exchange for other necessary goods can invest the capital in other on or off farm activities.

The richer families have several other sources besides the rice cultivation such as gold or benevolent relatives in Phnom Penh or outside of Cambodia. With this they have invested in dry season land, horse carts, rice mills, motos etc.

The middle households are primarily farmers who profit from the surplus production. Due to their large families at distribution time they were able to cultivate enough surplus to acquire more land. Land division to children has had little impact on their socio-economic situation. Surplus is invested in More dry and wet season land.

The two poorer groups have less land either because they had not claimed any or have not been able to augment it. Land division among children has been avoided to keep a reasonable parcel to sustain the household. Hence, the increase in this group of young couples with little or no land to support themselves. This in combination with their lack of labour has not given them the chance to increase their land size and create sufficient produce. The next poor families usually have a rice shortage of one to three months which they solve by doing wage labour. The poorest group lack labour, have a rice shortage for six to eleven months and many have sold their land. With the capital generated from selling land they buy up rice to sell in Kandal. Some are able to make profits, others lose everything and survive on wage labour.

The different types of draught-animals have impact on labour relations and timing of cultivation. The no 1 pairs can plough faster and thus cover more area in the same period of time. Labour is exchanged for ploughing and thus richer families have access to more labour at a lower cost. They can also make sure that their land is ploughed in time while families without draught-animals or with local weaker animals do not have this advantage. This is particularly true for the DS cultivation in which timing is important due to the water availability and the IR seeds used.

Exchange labour is practised on a large scale where one day is returned for one day except ploughing where a morning is returned for a full day. The timing of the DS rice being so exact has led to an increase in hiring of labour where the richer households are willing to pay more to have the activity done in time.

Remarkable in Prey Sambuo was the large number of abandoned women.

These women can not all be found in the same socio-economic category but are found in the two poorer groups. Some of the women have had to sell all their land or lost it due to debts made by the husband. Others have been able to keep their land and produce just enough to sustain the

household. There is no legal support for these women and their uncertain situation is not recognised. One of the women we spoke to explained that she had been to the commune and district leader to get her husband to repay her his debts and for child support. She travelled to Takeo three times to plead her case in court but because her ex-husband did not turn up, they refused to settle the case. By this time she had spent so much money without any result that she gave up. Perhaps the women's centre in Takeo could develop some kind of legal and temporary financial support for these women.

Ecosystem	Cropping Pattern	Cultivated Area		Production	
		'000 ha	%	'000 t	%
Lowland	Rain fed (wet season - May/July to Nov/Jan)	1 422	77	1 485	67
	Supplementary irrigation (wet season)	173	9.4	311	14
	Irrigated (dry season - Jan to Apr)	25	1.3	60	2.7
Flood Recession	(early dry season - Dec to Apr)	79	4.3	190	8.5
Deep Water Flooding	Floating Rice (May to Feb)	121	6.5	146	6.5
Upland		24	1.3	29	1.3
TOTAL		1 844	100	2 221	100
Notes:	1	This table is based on the total cultivated area and paddy production for 1992/93 as reported in government statistics (DoP, 1993a & 1993b).			
	2	Additional information on the distribution of area and production between ecosystems has been taken from the Inventory and Analyses of Existing Systems (Halcrow, 1994a).			
	3	There is a conflict between the dry season area (104 000 ha), derived from the Inventory and shown in this table and that stated in the Bulletins of Statistics (143 000 ha).			

Source: Halcrow, '94.

Cambodian Rice Ecosystems - Estimated Areas & Production



ANNEX 8

DAILY TIME LINES

The following timelines are examples of the lines drawn in Prey Sambuo. Only 4 examples are given here as the rest of the 48 cases are discussed in section 8.2.2. FHH stand for female headed households and CHH for couple headed households

Women in lower socioeconomic groups during wet season

FHH	CHH
05:00 wake up, clean house, feed pigs.	wake up, clean house.
06:00 go to the market.	go to the market
07:30 cook	collect food, cook
08:30 lunch	bath children
08:45 collect food, fishing	
09:00	lunch
10:00	rest
12:00	look after children visit friend
16:00 cook and have dinner	cook and have dinner
17:30 rest	feed pigs
19:00 listen to the radio	sleep
20:00 sleep	

Women in lower socioeconomic groups during the dry season

CHH	FHH
03:00	wake up, cook for labourers
04:00	
05:00 wake up, cook	take food to boat
06:00 walk to the field	take boat to field
07:00 have breakfast	breakfast
07:30 harvesting	clean pots, pans
08:00	carry seedlings
12:00 have lunch	lunch, rest
13:00 harvesting	transplanting
16:00	walk home
17:00 walk home	cook and wait for husband
18:00 cook, have dinner	
19:00 sleep	have dinner
20:00	watch t.v.
21:00	sleep

Men in lower socioeconomic groups during wet and dry season

DRY season

04:00
05:00 wake up, bring cow to field
go to look water in the field
06:00 ploughing
08:00 rest
09:00 lunch, rest
12:00
13:00 cut grass, fishing
15:00 bring cow home, feed cow,
repair fishing net
16:00 rest, carry water
17:00 dinner
18:00 listen to radio, watch t.v.
21:00 sleep
22:00

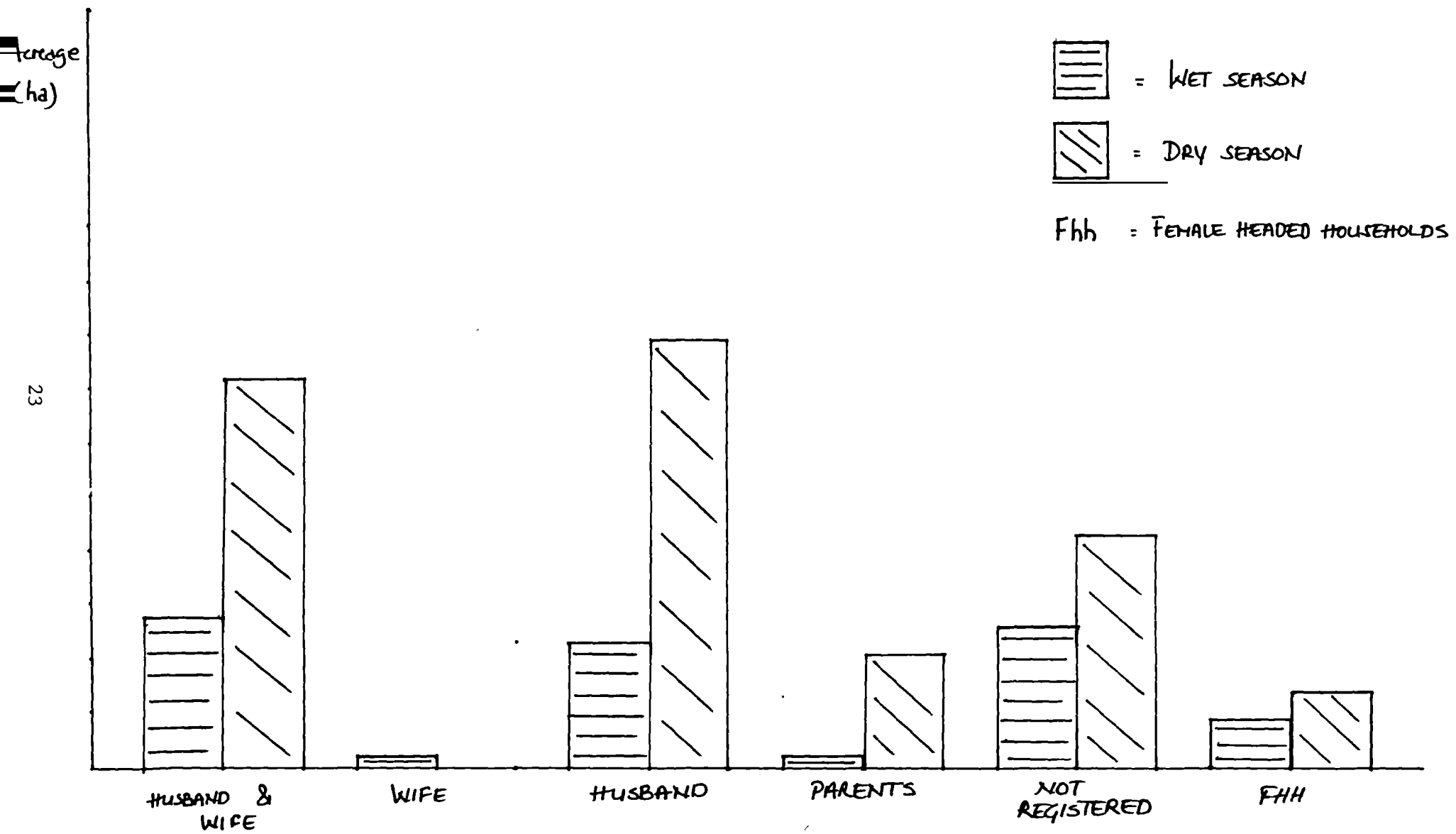
WET season

wake up, drive oxcart/go to field
raking

lunch
make bunds, control water, clear field

go home, dinner
uprooting, transport seedlings

sleep



Source: Questionnaires and semi structured interviews. Only to be used as case material. For statistical validity more accurate data needs to be gathered.

Comparison of title holders and acreage of wet and dry season land in Prey Sambuo.





