ISSN 1560-9197

Facing the Challenge of Rural Livelihoods

A Perspective from Nine Villages in Cambodia

Working Paper 25

Chan Sophal and Sarthi Acharya

Working Paper No. 25

CAMBODIA DEVELOPMENT RESOURCE INSTITUTE

Facing the Challenge of Rural Livelihoods

A Perspective from Nine Villages in Cambodia

Working Paper 25

Chan Sophal and Sarthi Acharya

Cambodia Development Resource Institute
Phnom Penh, December 2002

ISSN 1560-9197

Facing the Challenge of Rural Livelihoods —Working Paper 25
December 2002

Chan Sophal and Sarthi Acharya

Responsibility for the ideas, facts and opinions presented in this research paper rest solely with the authors. Their opinions and interpretations do not necessarily reflect the views of the Cambodia Development Resource Institute.

Cambodia Development Resource Institute
56 Street 315, Tuol Kork, Phnom Penh (Postal address: PO Box 622, Phnom Penh, Cambodia)
Tel: (855-23) 368-053/880-734/883-603 Tel/Fax: (855-23) 366-094
e-mail: cdri@camnet.com.kh website: http://www.cdri.org.kh

Editing: Andrew Young
Layout: Em Sorany
Printed and Bound in Cambodia by Japan Printing House, 74 Street 99, Phnom Penh

Contents

Executive Summary 1
Acknowledgements 7
Location Map of the Nine Villages 8

Chapter One: Introduction 9
1.1. The Country Setting 9
1.2. Emerging Issues on Land, Poverty and Food Security 10
1.3. The Land and Rural Livelihoods Study 12

Chapter Two: The Village Sample 15
2.1. Choice of the Sample 15
2.2. Sample Size 16
2.3. Basic Facilities in the Villages 17
2.4. Household Characteristics 18
2.5. Summary 19

Chapter Three: The Process of Land Acquisition and Landlessness 21
3.1. Land Acquisition, Sales and Landlessness 21
3.2. Land Conflicts 28
3.3. Distribution of Agricultural Land Holdings 28
3.4. Land Tenancy 30
3.5. Land and Other Assets 31
3.6. Land Holdings and Income 32
3.7. Summary 33

Chapter Four: Farm Productivity and Cost of Production 35
4.1. Farm Size and Productivity 36
4.2. Regional Variations in Yields and Food Availability 38
4.3. The Cost Structure 38
4.4. Profitability of Crops 40
4.5. Productivity and Profitability Association 42
4.6. Summary 44

Chapter Five: Indebtedness and Credit Needs 45
5.1. Households Contracting Loans 46
5.2. Loan Amounts and Interest Rates 47
5.3. Incomes and Interest Rates 48
5.4. Loans and Repayment Capacity 48
5.5. Summary 49

Chapter Six: Diversification of Rural Livelihoods, Common Property Resources and Total Income 51
6.1. Household Income by Source 51
6.2. Changes in the Source of Income in the Three Resurveyed Villages 53
6.3. Sources of Income by Income-Classes 55
6.4. Importance of Common Property Resources to Rural Livelihoods 57
6.5. Trends in the Availability of Common Property Resources 59
6.6. Summary 61

Chapter Seven: Consumption Patterns and Food Security 63
7.1. Aggregate Food Consumption 64
7.2. The Food Basket 68
7.3. Non-Food Consumption 69
7.4. Engel Elasticities 70
7.5. The Poverty Line and Poverty Comparisons 71
7.6. Population Distribution by Consumption Expenditure and Extent of Poverty 73
7.7. Summary 76

Chapter Eight: Labour Markets 77
8.1. Labour Force Participation and Child Labour 77
8.2. Self Employment in Agriculture 78
8.3. Cash Earning Jobs 79
8.4. Labour Migration to Thailand 80
8.5. Summary 81

Chapter Nine: Crises, Responses and External Assistance 83
9.1. Prevalence of Crises and Monetary Losses 83
9.2. Response to Crises 85
9.3. External Assistance to Alleviate Crises 86

Chapter Ten: Conclusion 89
10.1. General Findings 89
10.2. Understanding the Cambodian Rural Economy 91
10.3. Policy Options 93

Appendix One: The Sample Characteristics Data 95
Appendix Two: Land Acquisition and Landlessness Data 99
Appendix Three: Farm Productivity and Cost of Production Data 103
Appendix Four: Indebtedness and Credit Needs Data 107
Appendix Five: Diversification of Rural Livelihoods, CPR and Total Income Data 109
Appendix Six: Consumption Patterns and Food Security Data 113
Appendix Seven: Labour Market Data 115
Appendix Eight: Crises, Responses and External Assistance Data 117
References 119
CDRI Working Papers 121

List of Figures and Tables

List of Figures

Figure 3.1. Type of Land Acquisition (by percentage distribution of agricultural plots) ... 22
Figure 3.2. Lorenz Curve of Agricultural Land Holdings ... 30
Figure 3.3. Household Assets by Land Holdings (million riels) ... 32
Figure 3.4. Mean Annual Household Iincluding Personal Crop Production (million riels per year) ... 32
Figure 6.1. Household Income by Source (thousand riels per year) ... 52
Figure 6.2a. Change in Household Income by Different Sources in Babaong Village, Prey Veng (thousand riels per year) ... 54
Figure 6.2b. Change in Household Income by Different Sources in Prek Kmeng village, Kandal (thousand riels per year) ... 54
Figure 6.2c. Change in Household Income by Different Sources in Trapeang Prey village, Kampong Speu (thousand riels per year) ... 54
Figure 6.3. Sources of Household Income by Quintile of Income Groups (thousand riels per year) ... 56
Figure 7.1a. Rice Consumption by Deciles and Season (kg per day per adult unit) ... 66
Figure 7.1b. Total Food Consumption by Decile and Season (riels per day per adult unit) ... 67
Figure 7.2a. Change of Non-food Consumption by Village Between Round 1 (Dry Season) and Round 2 (Wet Season). Riels per day per adult unit ... 70
Figure 7.2b. Change of Non-food Consumption by Decile between Round 1 (Dry Season) and Round 2 (Wet Season). Riels per day per adult unit ... 70
Figure 7.3. Lorenz Curve of Food and Total Consumption Expenditure ... 73

List of Tables

Table 2.1. Sample Outline ... 16
Table 2.2. Basic Infrastructure ... 17
Table 3.1. Percentage Distribution of Agricultural Land Plots to Total Agricultural Land (by date of acquisition by current owners). ... 23
Table 3.2. Land Sales Since 1989 ... 24
Table 3.3. Main Reasons for Selling Land Plots (by percentage distribution of households who sold land). ... 24
Table 3.4. Landlessness and Related Variables ... 26
Table 3.5. Reasons for Agricultural Landlessness (by percentage distribution of households) ... 27
Table 3.6. Incidence of Land Conflicts and the Type of Land Involved in Conflicts ... 28
Table 3.7. Agricultural Land Holdings (by percentage distribution of households) ... 29
Table 3.8. Land Tenancy and Average Rental Size (by distribution of households) ... 31
Table 3.9. Mean Annual Income, Including Personal Crop Production (million riels) ... 33
Table 4.1. Wet Season (or non-irrigated) Rice Cultivation in 2001 by Farm Size (all villages) ... 37
Table 4.2. Dry Season (or irrigated) Rice cultivation by Farm Size in 2001 (all villages) ... 37

Table 4.3a. Cost of Wet-season Rice Production in 2000-01 (per hectare) 39
Table 4.3b. Cost of Dry-season Rice in 2001 40
Table 4.4. Profitability of Wet Season Rice Production by Farm Size (all villages) 41
Table 4.5. Profitability of Dry Season Rice Production by Farm Size (all villages) 42
Table 5.1. Percentage of Households with Outstanding Credit 46
Table 5.2. Interest Rate and Amount of Loan Obtained over the Wet and Dry Seasons 48
Table 5.3a. Loan as a Proportion of Income (by income classes) 49
Table 5.3b. Loan as a Proportion of Income (by village) 49
Table 6.1. Percentage of Households Earning Income from Different Types of CPR 58
Table 6.2. Availability of Fish and other Resources from Water Bodies or Rice Fields Compared to One-Year Previously (percentage of households responding) 59
Table 6.3. Main Reasons for the Decline in Fish and other Water Resources (percentage distribution of respondents) 60
Table 6.4. Responses to Trends in the Availability of Forest and Related Resources Compared to One Year Previously (percentage distribution of households) 60
Table 6.5. Responses to Main Reasons for the Decline in Forest Resources (percentage distribution of households) 61
Table 7.1. Food Consumption and Total Expenditure for 2001 and 1996–97 (per capita, per month) 64
Table 7.2. Per Adult Unit Consumption of Rice and Total Food by Seasons 65
Table 7.3. Rice Consumption per Capita per Day: Adjusted for Adult Unit and Unadjusted 67
Table 7.4. Food and Consumption Per Adult Unit (average of wet and dry surveys) 68
Table 7.5. Percentage Share of Different Non-Food Consumption Items 2001 and 1996–97 (calculated from per capita adult unit expenses) 69
Table 7.6. Engel Elasticities for Rice, Non-Rice Food, Non-Food Items and Health 71
Table 7.7. Poverty Lines and Proportions Living Below Poverty Line (by village) 72
Table 7.8. Consumption Expenditure Classes (by percentage distribution of population) 74
Table 7.9. Measures of Poverty Gap and Poverty Intensity, 2001 and 1996–97 75
Table 8.1. Economically Active and Economically Inactive Population by Age and Sex 78
Table 8.2. Hours and Months of Engagement in Agricultural Work on Villagers' Own Farms, Ages 15–54 78
Table 8.3. Wages/Earnings by Educational Level, Job and Gender (thousand riels per day) 80
Table 8.4. Number of Migrants to Thailand and Wage Rates 81
Table 9.1. Prevalence and Magnitude of Crises, 2000–01 84
Table 9.2. Prevalence and Cost of Crises in One Year (by income quintiles) 85
Table 9.3. Responses to Crises by Income Quintiles (distribution of households) 86
Table 9.4. Prevalence of External Assistance 87

Executive Summary

Since the inception of the Research Programme at the Cambodian Development Resource Institute (CDRI), considerable effort has been devoted to undertake diagnostic and policy studies on rural livelihoods, land, poverty, and natural resources. In 2001, CDRI launched a field survey of nine Cambodian villages to study the current state of rural livelihoods. Based on this research CDRI has produced two working papers, Working Papers 24 and this Working Paper. Although published separately the two papers are complementary, sharing the same context and subject matter. Additionally, the overall research undertaken for both these Working Papers is an expanded version of an earlier survey conducted by CDRI in 1996–97 [1] as three of the villages were also studied five years previously.

Working Paper 24 entitled *Land, Rural Livelihoods and Food Security in Cambodia*: *A Perspective from Field Reconnaissance* discusses socio-economic processes in six of the nine villages using qualitative methods (Sedara, Chan, and Acharya 2002). This paper complements that study by discussing results from a survey of 1,005 households in the provinces of Kandal, Kompong Speu, Prey Veng, Kampot, Kompong Thom, Battambang and Kratie. The provinces are spread across the four broad agro-climatic regions in the country — namely, the Coastal Areas, the Tonle Sap region, the Mekong Plain region and the Plateau Highlands. To cover aspects of seasonality in food consumption and income, the field survey was conducted in two rounds over the wet and dry seasons.

The main objectives of this working paper are to analyse rural livelihoods, measuring seasonality in food security, and comparing the food security situation in different ecological zones and with the survey conducted by CDRI in 1996–97. The specific research questions investigated in this paper and the main findings of the research are summarised below.

1) What is the nature of distribution of land holdings in different regions, and what is the extent of inequality in land distribution and landlessness?[2] What are the reasons for people selling or losing lands, and how have land markets emerged?
2) What is the relationship between farm size, productivity, and profitability generated by farms of different sizes in different regions, and does the size of farms affect food security?
3) What is the nature of credit markets? What is the frequency of demand for credit, by which category of farmers and at what cost? Is institutional credit of help, and if yes, to what extent?

[1] Working Paper 6, *Food Security in an Asian Transitional Economy: The Cambodian Experience* (Murshid, 1998)

[2] 'Landlessness' herein refers to agricultural landlessness in rural areas.

4) What are the processes by which the rural population currently obtains food and other products from land, common property resources, and other non-farm income sources? What is the impact of increasing privatisation of commons on the quantity and quality of products obtained from fishing and forest produce?

5) Do people face chronic food deficiency? What are the extent of inequality and the depth of prevailing poverty in rural areas?

6) What is the nature of labour markets? What are the current wages, and to what extent do people get wage labour — locally as well as through migration?

7) What are the adaptation strategies that people adopt for coping with crises, by different categories of households?

1. Land Inequality and Landlessness

Following the land redistribution in the mid-1980s and the reintroduction of private ownership of land in 1989, land markets began to evolve in all nine of the villages studied. As of 2001, only 44 percent of the landholders reported that the land that they presently own was given by the state. An additional 24 percent reported they inherited it, 17 percent purchased it and 16 percent had cleared the forest to claim land. In villages that have access to forest (including inundated forests), land clearance is continuing.

The principal, though not the only reason, for growing landlessness is the population rise: as many as 30 percent of the newly formed families never had land. Other reasons are the inability to hold on to land for want of other resources, and inadequate incomes derived from land. In some cases, where the land quality is good or the plot is strategically located, speculative purchases have also been observed. Twelve percent of the sampled households reported that they have sold some or all of their land since 1989. The reasons why people sold land mainly emerge from their inability to earn sufficient income to meet family expenses, the most pressing expense being the one related to illness. Some also sold land since their plots had become uneconomically small due to subdivision. Agricultural landlessness is an average of 20 percent in the nine villages. Additionally, a further 25 percent own plots smaller than 0.5 hectares. This implies that the landless and the near landless total 45 percent of all rural households (though not all in rural areas are farmers). It is estimated that landlessness is rising at about 2 percent a year.

An average landholder household owns 1.5 hectares of agricultural land. However, the average does not convey much because the distribution of land ownership is highly unequal. Twenty percent of households own no land, 25 percent own 0.5 hectare or less, while the top 10 percent owns 40 percent of the land.

Does landlessness matter in ensuring livelihoods to rural Cambodians? The answer is yes; it matters because there is far too inadequate an expansion of off-farm and non-farm vocations in rural areas. Landless households have fewer assets and earn lower incomes compared to landholders. It is also equally important to note that the near landless are only marginally better off than the landless, and this is a serious concern as well.

2. Economics of Farming

Smaller farm sizes are generally, though not exclusively, more productive in terms of yield rates. This is more so in the case of rice cultivation in the wet season when the input application is low; in fact, the wet season crop virtually thrives on monsoon rains and physical labour. In the dry season crop, which requires greater physical input, the relationship between small farms and higher productivity breaks down. Small farms also offer better incomes to farmers *per hectare* in the wet season, but do not yield better incomes on a *household* basis. In dry season farming, neither income per hectare nor income per household is higher in small farms.

The overall cost structure for farming suggests that the material intensity of cultivation is low. In areas where farmers apply fertilisers and other inputs, they get better yields. This indicates the potential for expansion of production by increasing inputs, where it is profitable to do so.

3. Access to Credit

Borrowing money is an integral part of the peasant[3] way of life, meaning that people borrow for both productive purposes as well as for consumption without really making a distinction between the two. Because of this, most loans come from non-institutional sources, typically moneylenders and relatives/friends. Lenders perceive risks of default to be high, and at the same time, the supply is limited. Consequently, the interest rates are high.

There appears to be an inverse association between the size of land holdings of borrowers and the interest rate paid by them. This might be a weak association, but it suggests that possession of larger plots of land is a hedge against default. The proportion of outstanding debt per person is high among the poor compared to the non-poor, though the absolute amounts borrowed by the poor are far smaller than those borrowed by the non-poor. Most farmers and villagers are indebted.

4. Total Household Incomes

The average household income in the villages is well below the national average. Even in the most developed villages, a household earns only $923 a year compared to the national average of $1,300. Rural households derive their incomes from quite diverse sources with average income from agriculture constituting no more than 30 percent of total income.

Rural households rely heavily on hiring out labour and access to common property resources (CPR).[4] Compared to five years ago, agriculture has progressed remarkably, increasing its share in the total income. In contrast, except in villages that have benefited from the partial release of fishing lots and fish culture, incomes from CPR have decreased considerably. Villagers now increasingly undertake local wage labour or migrate from their village to find piecework elsewhere. Poorer households have traditionally been more dependent on CPR for survival and are losing out, as alternative incomes from wage labour are low, often less than a dollar a day.

Villagers now travel further to collect resources from forests and water bodies. They blame over-exploitation and the use of illegal means of collection (*i.e.* explosives or electric shocks for killing fish) for the decrease in benefits from CPR.

5. Consumption and Poverty

There is large regional and seasonal change in total household expenditure. Food consumption constitutes up to 68 percent of the total expenditure, though it varies from 59–78 percent between different villages. The more affluent villages spend a lower proportion of income on food. Rice consumption is relatively inelastic, meaning that people aim to consume a certain proportion of it (not more, not less) irrespective of their socio-economic class, but other non-food items are more elastic. When taken as a group, non-food items are as elastic as food items, other than rice, but health expenditure is inelastic. This implies that both poor and non-poor have to spend a relatively non-negotiable amount on illness. Expenditure on illness forms about 9–10 percent of total household expenditure.

---

[3] The term ‘peasant’ is used formally here and describes people in poor countries who predominately undertake farm work on a piece of land on which they live.

[4] CPR primarily refers to to fish and forest resources in Cambodia.

For the nine villages on aggregate, the number of people living below the poverty line is about 38 percent. There are significant differences between the villages, however. In poorly endowed and low productivity villages, where many people earn from wage labour, the percentage of poor people is well above 60. In better-endowed, high-productivity villages where most earn from physical resources, less than a quarter live below the poverty line. Patterns in the intensity of poverty are similar. This implies that incomes gained from labour are much lower than the traditional incomes gained from physical resources.

A comparison can be made to 1996–97 when the earlier CDRI survey was conducted in three villages. In the two villages that are well endowed with physical resources, the poor have reduced by large proportions. In the third village, which is poorly endowed and large numbers work for a wage, the proportions living below the poverty line have risen.

6. Crises and Vulnerability

Facing crises, whether natural or man-made, has almost become a way of life in most villages. In addition to perennial health problems, the extraordinary floods in 2000 and 2001 increased the financial problems in villages located in the Tonle Sap and Mekong regions. The non-poor suffered greater monetary loss than the poor did, but the poor paid a higher price in proportion to their income.

Types of responses to crises differ considerably across villages and households. Most affected households responded to crises by dipping into savings and/or reducing their consumption. Less common choices included contracting loans, selling land, and migration. NGOs and government agencies provided relief assistance to a number of households in the villages hit by the floods.

Seen in the context of food security, the poor are highly vulnerable in the face of both natural disasters and personal problems. In the absence of any social security, many end up parting with their means of livelihood, making them even more vulnerable.

7. Labour Issues

Child labour is a significant factor. Many children do work full time. Many more children who are in school also participate in work.

Next, work undertaken by people on their own farms does not employ them for more than five months on average. Both men and women spend about equal time on family farms. This is a slack time for many, since work on their own farms does not take up all the time of the villagers. For the other seven months, they work on CPR, wage labour (which can include migrating) or petty trade.

Wages earned by male workers are, on average, about 15 percent higher than that of female workers, though the specific tasks undertaken by male and female workers can be different. Wage incomes across the villages are mostly between 3,000–5,000 riels a day, though wages earned by migrant workers in Thailand are about 6,000–7,000 riels a day. In select industry groups, workers having secondary level education or above, earn about 20 percent more than those having some basic education while, in turn, those with basic education earn about 18 percent more than the illiterate.

In the context of food security, wage labour is assuming increasing importance. Yet, almost all the work that Cambodian workers carry out is of the manual and unskilled type. Prevailing wage rates are low and barely sufficient to maintain livelihoods. This is the reason for the level of poverty not reducing at a rate that planners would desire.

8. Seeking to Comprehend Rural Livelihoods in Cambodia

It is well known that Cambodian agriculture has its origins in *extensive* farming systems, in which the total population dependent on land and other natural resources was always small.[5] Therefore, despite low productivity, there was sufficient food. Even until the mid twentieth-century the population was less than 4 million (compared to about 11 million in 1998).

With increasing commercialisation of the rural economy and exposure to larger markets for most of the twentieth-century, the agricultural system has experienced increased strain. There has been limited effort to alter the structure of supply or organisation of production within the rural economy and there are now many claims on the forest, water, fish, and land resources from outside the agrarian sector. To make matters worse, the population is rising rapidly and demands on resources from within the rural economy are rapidly increasing. With demand increasingly exceeding the supply, less and less resources of the traditional type (*i.e.* land, forests and fish) are available for rural people.

In several areas, agriculture is being modernised and high yield variety seeds, fertilisers and controlled irrigation are finding increasing acceptability. This 'green revolution' is particularly successful in areas possessing better quality soils and easily accessible water resources. In these areas, farmers' incomes are rising and agriculture is steadily becoming the dominant source of livelihood. In some other areas, resources like fish are still plentiful (or fish availability is increasing with the introduction of fish culture). Incomes, therefore, are increasing in areas wherever resources are growing (or being developed) and those who own the resources gain.

Elsewhere, where resources are shrinking, the weight of an increasing demand is taking its toll. As people's incomes from traditional sources are reducing, they are increasingly taking up wage labour, but returns from labour are lower than returns from productive physical resources. In a transfer of occupations that is taking place in all locales — whether deficit or otherwise — some people's incomes are reducing because of low wages and less work. Consequently, the aggregate poverty rate is not reducing at paces that would be commensurate with other macroeconomic variables, such as GDP growth.

Agriculture is not expanding fast enough and current land yields in Cambodia are the lowest in all of Southeast Asia. Among the reasons are credit constraints, inadequate irrigation, insufficient market linkages, and poor quality infrastructure (both physical and social). Additionally, rural non-farm activities are not growing for similar reasons. A slow growing rural economy is naturally unable to effectively support increasing numbers joining the labour force each year, which is by itself a reason for growing food insecurity.

Returns from labour are low for at least three reasons. First, in both rural and urban areas, the non-farm sector is not growing fast enough. Wherever it is growing, such as in the garment sector, construction, and tourism, there is insufficient job growth. Second, the nature and composition of economic growth is such that it has few links to rural areas. Third, investment in human capital is low in Cambodia, particularly in rural areas.

As stated previously, farmers still derive incomes from multiple sources. With a few sources of income becoming less available (*e.g.* forests and fisheries), some villagers' incomes are falling. On the other hand, if full access to commons is permitted, the commons could rapidly deplete under the new market integration system, as was seen for some time in the 1990s. It is not clear whether the new 'community-based' management of resources, which has been proposed by the government and donors alike, will find a solution to this problem.

What can be said about the overall food-security situation? There is no denying that food production has been rising slowly but steadily, and that this will continue in the near

[5] See Boserup (1965) for classification of agricultural systems.

future, as larger numbers of farmers plant modern variety seeds and fertilisers, and harness water for irrigation. Additionally, some crop diversification is taking place. Each of these achievements, however, can only improve the security of food-deficit farmers and villagers in a limited way. Much of the distribution of gains will depend on whether, and to what extent, both wage and labour opportunities grow, not only in agriculture but in other activities as well.

Acknowledgements

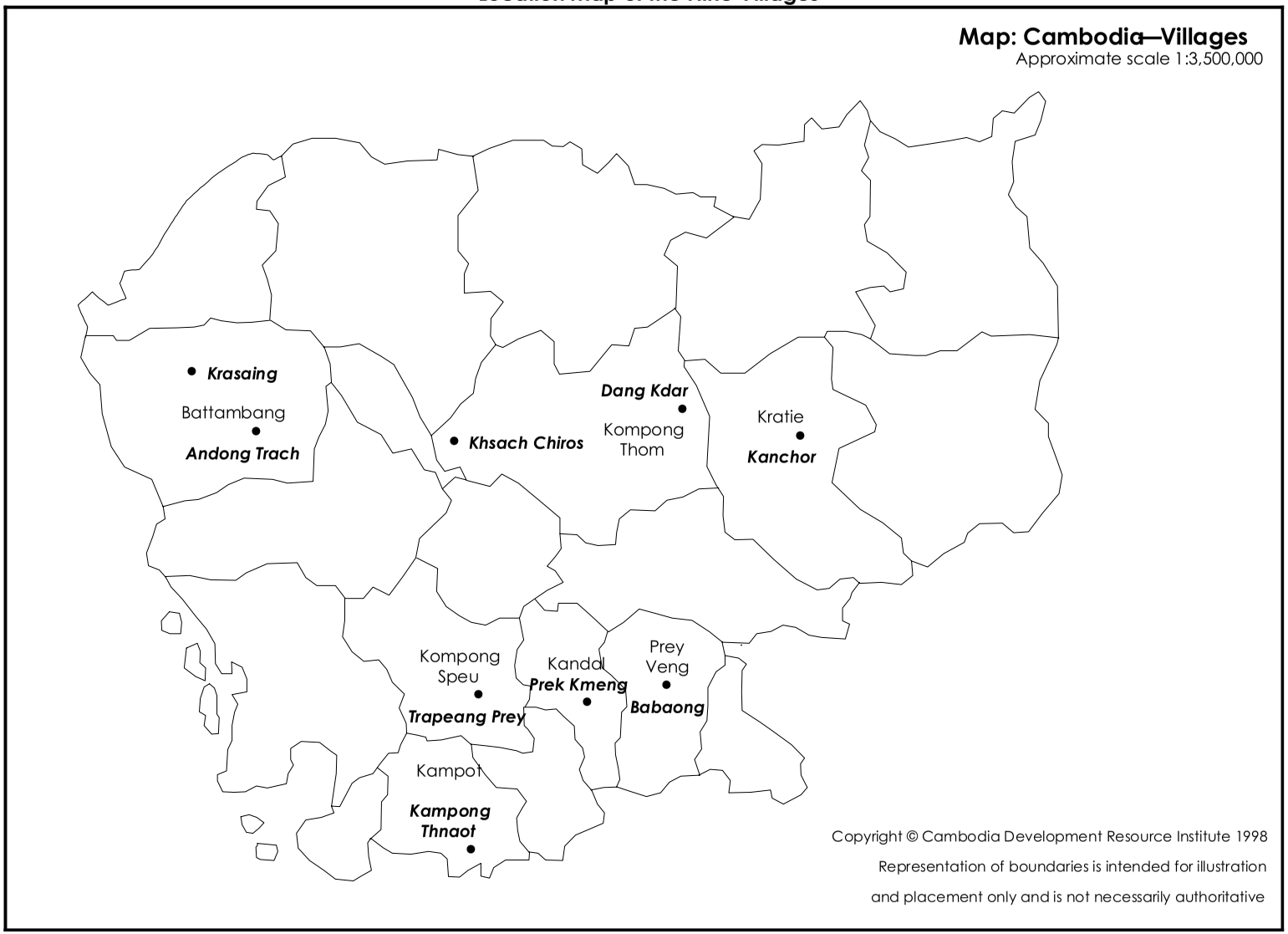
During the course of this study over the past two years, the authors have accumulated debts of gratitude to many individuals and institutions without whose support and cooperation, this study could have never been completed. First and foremost, we are greatly indebted to the many villagers, most of whom volunteered to spend their time critical for daily survival to offer us the needed information. As usual, we take so much from village respondents and give so little in return. Hopefully, our debt will be partly addressed by a positive policy impact resulting from the study. Similarly, our gratitude also goes to the many officials at the district and provincial level that made this study possible.

The authors are also grateful to the many enumerators and field supervisors, who worked under hard conditions to ensure quality of data. We owe a great deal of gratitude to Kim Sedara, So Sovannarith, Chim Charya, and Pon Dorina for their very able assistance in data collection, verification, cleaning, and clarification.

We would like to pay our profound gratitude to the Department for International Development (DFID-UK) for its timely financial support.

The paper has benefited from valuable comments and discussions provided by Dr. Gus Edgren, Dr. Daram Ghai, Dr. Daniel Arghiros, Mr. Bruce McKenney, Ms. Eva Mysliwiec and Mr. Andrew Young. Last but not least, our gratitude goes to Mr. Dararith Kim Yeat, Ms. Beauphara Thong and Ms. Nou Kol Sorya for the excellent managerial and logistical support that enabled smooth and effective fieldwork.

Location Map of the Nine Villages



Chapter One

Introduction

1.1. The Country Setting

According to the Census of 1998, about 80 percent of Cambodians live in rural areas and nearly 85 percent are engaged in agriculture and allied activities. In absolute numbers, the rural population was estimated at 9.6 million in 1998; this could have risen to 10.6 million in 2002, given a population growth rate of about 2.5 percent.[6] Although very large numbers of Cambodians engage in agricultural or related activities, Cambodia is not a land-scarce nation. The total area of the country is about 18.1 million hectares, out of which about 3.9 million hectares are under one crop or another. The rice crop is cultivated on about 2.3 million hectares and other crops and plantations cover the remaining 1.6 million hectares. Another 1.7 million hectares are unused land being neither under forests, inundated, or mountainous (McKenney and Prom 2002; Chan, Tep and Acharya 2001). There are, therefore, 5.6 million hectares of land in the form of cultivated or cultivable land. Seen from this perspective, the land availability per capita is quite favourable.[7]

Cambodia has exhibited impressive growth in its national income since the early 1990s. Between 1992 and 1996, the average annual growth in GDP was well above 6 percent, though the rate of growth has since slowed. The average annual growth for the period between 1997 and 2002 was nevertheless respectable, in the range of 4.5–5 percent, though there were occasional fluctuations. Most of this growth, however, occurred in a narrow band of activities like garment manufacture and tourism and was concentrated in select urban centres. For example, the total number employed in garment industries has not exceeded 200,000, which forms a little over 3 percent of the workforce. Next, total employment in the formal sectors (sectors where there is some wage regulation such as the garment sector) is about 5 percent, or 280,000 workers. Evidently, employment in these sectors is not large enough to make a significant dent on the structure of the labour force. At the same time, even in these sectors the wages ($40–60 a month) are not high enough to create a multiplier effect in other sectors. The multiplier effect is also limited by the fact that value added in all sectors (including modern growth sectors) is shallow: it is small and at the same time, has few if any linkages to other sectors. In other words, the impact of this industrialisation for rural areas is minimal (Acharya 2002).[8]

---

[6] All population data have been obtained from *CDRI's Annual Economic Review*, which has in turn been obtained from forecasts and estimates made by the Ministry of Planning.

[7] This statement is comparative, as the per capita arable land availability in other parts of the developing world could be much less. See World Bank (2001).

[8] The elasticity of poverty reduction with growth was only 14 percent for the 1990s (Acharya 2001). This relatively disjointed structure of production and distribution makes Cambodia different from many other countries in the region, typically Thailand and Vietnam.

It is not surprising that Cambodia is among the poorer nations in the Asian continent. Agriculture continues to be largely subsistence oriented and the average productivity of crops in Cambodia is generally among the lowest in Southeast Asia. Since such a large proportion of people live in rural areas and draw a living from agriculture and its allied activities, agricultural growth is important, but this has been less than 1 percent annually (Sok and Acharya 2002). In addition, the high population growth of 2.5 percent a year in the 1980s and 1990s has resulted in more people now entering the labour market and this is increasingly putting pressure on available employment and earnings.

Poverty, measured in calorific terms — a person is deemed to be below the poverty line if they consume food worth less than 2,100 kilo-calories a day — was estimated as 39 percent in 1993–94 (RGC 1999). This proportion reduced by only 3 percent to about 36 percent in 1997. It is believed that the percentage living in poverty has stayed almost the same since (RGC 1999; RGC 2001). Almost 90 percent of the poor live in rural areas and work in agriculture in addition to engaging in fishing and foraging. The principal means of subsistence in rural areas are agricultural land and fishing. It follows, that insufficient land, much of it poor quality (or low land investment), low land productivity or landlessness, and reduced access to fishing areas, are both individual and combined reasons for a low standard of living.

The greatest challenge facing Cambodia today is to make rapid progress in alleviating rural poverty. The rural economy needs to be placed on a rapid and sustainable growth path; a path that would ensure the equitable distribution of gains in growth to all sections of rural society. In such an endeavour, its principal resource, namely land, forests, and water-bodies, need optimal scientific utilisation.

1.2. Emerging Issues on Land, Poverty and Food Security

Rural livelihood studies conducted in Cambodia address varied issues that include land distribution and landlessness, agricultural growth, access to CPR and poverty measurement. The studies include: Murshid 1998; Williams 1999; Kato 1999; Biddulph 2000; Williams 2000; Sik 2000; So *et al* 2001; Chan, Tep and Acharya 2001; RGC 2001; Chan and Acharya 2002; Sok and Acharya 2002 and McKenney and Prom 2002. Some principal findings emerging from these studies are listed below:

1.2.1. Land Inequality and Landlessness

According to the Socio-economic Survey (SES) of 1999, the Gini coefficient of inequality[9] in agricultural land holdings was 0.57 and the number of households not possessing any agricultural land was about 16 percent in rural areas. This inequality in land distribution and landlessness emerged in less than a decade: in 1989, when lands were formally privatised, it is widely believed that the redistribution was largely equitable.[10] Different calculations based on the studies quoted above suggest that landlessness is growing by about 2 percent each year.

Agricultural land is rapidly changing hands through sale (particularly those plots that have high market value), or in some cases land grabbing and intimidation. Cases of land conflict have also been reported, and the capacity of the administration to deal with such issues is limited. Official records on land transactions also confirm that land markets have been quite active, particularly in the more market-exposed provinces. It would be possible to conclude that such transactions and transfers finally lead to inequality in land distribution.

The rapid population growth has been partly responsible for the increased subdivision of land holdings, as farmers attempt to provide their grown-up children with some land to

[9] A Gini coefficient is a numeric equivalent of what a Lorenz Curve exhibits graphically (see also Chapter 7)

[10] Families that returned from border camps came in much later. Not all of them were given land.

cultivate as they establish their own families. The demographic pressure, in the absence of adequate occupational diversification, atomises average holdings and increases the proportion of households owning rather tiny holdings or none at all.

12.2. Land and Production

Rice land was plentiful in Cambodia in the 1960s. Despite a relatively low yield rate of crops at the macro level, there was self-sufficiency and an export surplus as the land use to population ratio was comfortable. The following three decades of conflict redefined the contours of agriculture. The cultivated rice land area declined from 2.5 million hectares in 1967 to 1.9 million in 1994. Only by the turn of the millennium did the sown area exceed 2.3 million hectares again.[11]

The situation with respect to rice availability, however, is not yet satisfactory. Despite some recent improvements, Cambodia lags quite far behind its Asian neighbours in terms of the yield rates and profitability of crops. Between 1980 and 1994, the average yield for rice ranged between 0.9–1.4 tonnes per hectare. Since 1995, it has consistently maintained itself well above 1.6 tonnes per hectare, and in 1999, it touched 2 tonnes per hectare. However, this is still low compared to yield rates of well over 3 tonnes achieved in Vietnam, Indonesia, and the Philippines.

Owing to the increase in both cultivated lands and rice yields, total rice production doubled between the mid-1980s and the late 1990s, exceeding 4 million tonnes for the first time in 1999 and yielding some surplus at the national level. However, this does not ensure freedom from hunger for all. First, there are marked year-to-year fluctuations in rice production due to the unpredictability of weather conditions, especially floods and droughts, which can lead to a rice surplus in one year and a rice deficit in the next. Second, there are wide variations from one region to another. Third, there are wide variations in food availability between the landed households and the landless. Food insecurity is exacerbated by the relatively poor integration of the rural population into larger markets.

It is widely agreed that to alleviate food insecurity, high priority should be attached to raising productivity in rural production systems, particularly in agriculture. Accordingly, one of the challenges in alleviating rural poverty is to identify constraints to increasing agricultural productivity at the farm level.

1.2.3. Increasing Demographic Pressure on Land

Since the end of 1979, the balance between the supply and demand of land has been changing. The 1980s and 1990s was a period of very rapid increase in the population — in the range of 2.5 percent annually — outstripping growth in agricultural production and productivity. This has created a large demand for food, though this is not necessarily articulated for want of purchasing capacity. The sudden population increase has also affected the age structure of the population; there are too many persons in the very young age group compared to the working population, reducing earnings per person. Additionally, the number of newer families looking for land is also rising, as more and more people reach adulthood. The Oxfam (GB) studies[12] find that among those currently landless (in 2000), 56 percent never had land. Of those who never had land, 42 percent were newly formed families and 53 percent were migrants. These statistics are evidence to the fact that demographic forces largely explain why people are landless.

The significance of new household formation in the potential demand for new agricultural land could be assessed by looking at projections derived from the Population

[11] These figures do not include land under plantation agriculture.

[12] Oxfam (GB) conducted a large research programme on different aspects of land with the 'Cambodian Land Project'.

Census of 1998 for the age group most likely to correspond to first marriage (20–24 years). The number of persons in this age group is expected to increase by 40 percent between 2001 and 2006, and to increase again by 13 percent between 2006 and 2011. This corresponds to a 58 percent increase in this age group compared to the last decade of the twentieth-century.

These age specific projections have very important implications for the likely demand for new land over the next 10 years. The projected increase in only the 20–24 years age group by 2006 (some 350,000 more persons) could mean up to 150,000 new rural households in need of land of their own — or alternatively seeking off-farm employment. The demand for land stemming from this age group will be in addition to the land needed for those who are currently landless. There is clearly a need for massive employment generation to absorb the population in the working age groups, particularly in rural areas (Desbarats and Sik 2000).

1.2.4. Small Farms and Markets

Farmers who cultivate very small plots are unable to apply modern inputs or investment on their plots, both because they cannot afford them, and because there are diseconomies of scale associated with very small farms. Hence, their productivity is low, which in turn adversely affects incomes. Next, the smaller farms get, the more difficult it is for them to integrate into markets on equal terms-of-trade.

1.2.5. Shrinking Common Property Resources

The traditional survival strategy among Cambodians has pivoted on crop agriculture, fisheries and forest produce. It is estimated that almost three quarters of an average Cambodian's protein intake is derived from freshwater fish. Additionally, forests provide a variety of essential goods. Due to increasing landlessness, the poor now have to rely more heavily on CPR such as fish, water birds, snakes, crickets and wild vegetables. This has led to over-fishing and overexploitation, particularly for natural resources that have an unrestricted access.

At the same time, the privatisation of CPR since the early 1990s, through the granting of forest and fishing concessions to private business interests has contributed to restricting villagers' access to commons. This has further reduced rural people's incomes derived from CPR. The loss of fish and forest resources and the increasingly restricted access to those resources exacerbates rural poverty and food insecurity.

The deleterious effect of the decline of fishery and forest resources on the food security and livelihood of local people is felt most acutely by the poorest and most vulnerable, since their dependence on the commons is higher.

The concurrent trends of landlessness and decreased access to commons compound to increase insecurity in livelihoods and to make rural households more susceptible to unexpected crises. These trends also deprive a growing number of young people any productive assets other than their own labour. In addition to directly contributing to an increase in rural poverty, they also have indirect ramifications for stability. The most visible consequences of rural food insecurity can be seen in increased levels of migration, both internally and internationally. More and more farmers, specifically those whose land can no longer support their growing families needs are moving in search of larger and more fertile land. In the process, the forests are being threatened. Large numbers of migrant labourers seek paid work in other areas as well, both within the country and in Thailand.

1.3. The Land and Rural Livelihoods Study

All the issues outlined previously should leave little doubt that there is a problem related to land and rural livelihoods in rural areas. CDRI has been a keen and concerned observer of the rural situation and has studied the rural livelihood problem for several years now. Conceived

in 2000, this study is among the more comprehensive of a number of studies that CDRI has conducted on land and its attributes in Cambodia.

Currently, knowledge of land and rural livelihood issues suffers from numerous gaps in information and understanding regarding the, what, why and how of the current situation and trends. It is therefore necessary to know and understand the current situation and trends, as this can assist recommendations to mitigate the consequences of current problems (especially if these problems continue to accelerate). This would, in turn, help frame and strengthen appropriate policies. Such interventions will be paramount if Cambodia is to achieve its development objectives.

The specific research questions studied here are:

1) What is the nature of distribution of land holdings in different regions, and what is the extent of inequality in land distribution and landlessness? What are the reasons for people selling or losing lands? Are there land disputes and insecure tenancy, and if there are what are the consequences?

2) What is the present land use pattern, by size of farms and holdings? What is the relationship between farm size, productivity, and profitability generated by farms of different sizes, in different regions, and under varying crop regimes? How do farmers of different means carry out their farming practices (*i.e.* how do they till their lands and what inputs do they apply) Finally, what levels of incomes do different farms sizes yield in different regions?

3) What is the nature of credit markets? What is the frequency of demand for credit by which category of farmers and at what cost? Is there differential access to credit and to what extent is institutional credit of help?

4) What are the processes by which the rural population currently obtains food and other products from common property resources — particularly forest resources and fish — and other income sources? Has there been a change in the livelihood means over the last few years, given that the access to commons may have altered? What is the impact of increasing privatisation of commons on the quantity and quality of products obtained from fishing and forest produce?

5) Is chronic food deficiency faced and is it seasonal? What are the extent of inequality and the depth of poverty prevalent in rural areas? What are the changes in the standards of living of people, between 1996–97 and 2001?

6) What is the nature of labour markets? What are the current wages, and to what extent do people get wage work — locally as well as through migration?

7) What are the adaptation strategies used for coping with crises, by different categories of households, including taking up off-farm employment and migration?

The main objectives of the present survey will include taking stock of the current situation, measuring seasonality in food security, comparing the food security situation in different ecological zones, and assessing the share and importance of CPR in rural livelihoods. The relationships between access to land, access to CPR, alternative local income-earning opportunities and rural food security will also be investigated, revisiting the three food security survey villages studied by CDRI in 1996–97. Many of these issues have also been reported in detail using qualitative methods in the parallel research, published as *Land Rural Livelihoods and Food Security in Cambodia: A Perspective from Field Reconnaissance* (Sedara, Chan and Acharya 2002).

The study has been conducted in nine villages which were distributed across Cambodia to represent the different agro-climatic zones of the country — namely, the Coastal Areas, the Tonle Sap region, the Mekong Plain region and the Plateau Highlands. The data were

collected using structured questionnaires at the household and village levels, with 1,005 households interviewed. There were two rounds of data collection to gauge the seasonal variations in food security.

Chapter 2 presents the methodology of the study and the sample details. Chapter 3 examines processes of land distribution and landlessness. Chapter 4 presents details on land use by its different attributes. Chapter 5 examines institutional credit, and Chapter 6 identifies the sources of income from commons, like forest and fisheries in addition to agriculture. Chapter 7 measures the standards of living, inequality, and issues related to food security. Chapter 8 examines the labour markets and wages. Chapter 9 highlights the prevalence of crises and studies the different coping strategies adopted by people, including opting to work for a wage. Finally, Chapter 10 concludes the paper with an observation on the shifts of the rural Cambodian economy in recent years.

Chapter Two

The Village Sample

2.1. Choice of the Sample

CDRI conducted a benchmark survey of three villages in 1996–97. These were Prek Kmeng, Babaong, and Trapeang Prey, the results of which have been published in Murshid (1998). This study resurveys those three villages in addition to surveying six more in the sample, taking the total to nine. The reason why nine villages were selected to represent four agro-climatic regions lies in the extent of diversity within each region. The provinces were chosen first through random selection. The exact procedure for choosing the villages was to initially consult the provincial and district level Department of Planning officials and brief them about the study's requirements. The officials then helped identify communes and villages that might meet the sample selection criteria (*i.e.* representing agro-climatic characteristics). After selecting two or three villages in each region that met the criteria, the research team made personal visits to these villages. The villages were finally chosen, based on a field assessment of which villages would best fit the criteria. Six of these villages were also subject to intense qualitative enquiry in the parallel survey published separately as *Land, Rural Livelihoods and Food Security in Cambodia: A Perspective from Field Reconnaissance* (Sedara, Chan and Acharya 2002).

Since the purpose of this research was to obtain village level profiles, the method adopted in the sample design was to interview a larger number of households in each village, rather than spread the sample across many villages. Although the coverage is somewhat smaller in the larger villages and larger in the smaller ones, the sample covers between 30–90 percent of the total households in the villages. As stated previously, the data were collected in two rounds: the first round over March/April and the second round over October/November. The first round asked respondents to remember from the previous October until March (the dry season, when there can be a shortage). The second round asked respondents to remember from April until October (the wet season, when there can be a surplus). An outline of the sample can be seen in Table 2.1.

The Tonle Sap Plains are fertile and people extensively cultivate rice, in addition to undertaking freshwater fishing. A large number of villagers from this region also migrate to find work in Thailand to support themselves and their families. They are attracted by higher wages in Thailand, and forced out by the high population increase. In the context of migration, Krasaing village was chosen to represent those villages where many workers migrate to Thailand. Next, Andong Trach from this region was chosen to represent villages that have received returnees from border camps, meaning that the village has witnessed a high level of resettlement and rehabilitation. Third, Khsach Chiros in the region represents those villages that depend primarily on fishing and floating rice cultivation: villages where rice yields are low despite favourable agro-climatic features.

Table 2.1 Sample Outline

Village	District	Province	Basic Criteria for Selection
Tonle Sap Plains			
Andong Trach	Sangke	Battambang	Substantial amount of wet season rice grown in flooded Tonle Sap, high resettlement of returnees from border camps
Krasaing	Thmar Korl	Battambang	Substantial amount of wet season rice grown in flooded Tonle Sap, high out-migration
Khsach Chiros	Kompong Svay	Kompong Thom	Floating rice plus substantial fishing in flooded Tonle Sap
Mekong Plains			
Prek Kmeng	Lvea Em	Kandal	Dry season rice and substantial fishing
Babaong	Peam Ro	Prey Veng	Substantial dry season rice
Plateau			
Kanchor	Chhlong	Kratie	Dry season rice and substantial forest dependence
Dang Kdar	Santouk	Kompong Thom	Low yield, wet season rice and substantial forest dependence
Trapeang Prey	Oudong	Kompong Speu	Low yield, wet season rice and dependence on hiring out labour
Coastal			
Kompong Thnaot	Kampot	Kampot	Low yield wet season rice, coastal fishing and salt mining

The low-lying Mekong Plain region is home to more than half the population of Cambodia. There is relatively high urbanisation here, though people in the villages are primarily engaged in agriculture and fishing. Babaong village, in Prey Veng province, was chosen to represent those villages that produce high rice surpluses. Next, Prek Kmeng in Kandal province was chosen to represent villages primarily dependent on fishing in addition to dry season agriculture. These are both villages from the 1996–97 survey and, therefore, did not have to be selected.

The Plateau region is generally characterised by low agricultural productivity and smaller populations, but is rich in forest resources. To understand the food security problems of the region, three villages were studied. Dang Kdar in Kompong Thom province and Kanhchor in Kratie province were chosen to represent villagers primarily dependent on forest produce. The third village, Trapeang Prey (a resurvey village) in Kompong Speu province represents the type of area from where people extensively migrate within Cambodia in search of a livelihood.

Lastly, Kompong Thnaot village from Kampot province was chosen to represent Cambodia's coastal region. A study in this village was expected to bring out issues related to coastal fishing and other activities such as salt mining.

2.2. Sample Size

On average, almost 39 percent of the population in the villages were surveyed (See Appendix 1, Tables 1–9 for a full breakdown of the sample characteristics). Except Trapeang Prey (a small village), which was surveyed on a census basis, the selection of households elsewhere was made on a random basis. The size of the sample in each village was determined on a quota sample method.

Seen in the Cambodian context, other than Trapeang Prey, the villages are large, as the average population of a village according to the Census of Cambodia in 1998 was about 560 residents (or 100 households). The choice of larger villages rests on the following logic:

a) Larger villages would present greater variety and should reveal diverse characteristics of village society.

b) It is likely that they are habitats that are more viable. To some extent, larger villages have become larger because of high in-migration. At the same time, they have been able to maintain a higher natural increase in the population.

c) As stated earlier, three villages — two of them large — were being resurveyed from 1996–97.

2.3. Basic Facilities in the Villages

There are regional variations in the endowments and standards of living of people across the villages, but all of them lack one or more basic amenities. For example, none of the villages is electrified through a public grid. The relatively more affluent households use batteries; others use hydrocarbon-based fuels for lighting.

Table 2.2. Basic Infrastructure

	Road access	School	Health care
Tonle Sap			
Andong Trach	Next to National Road 5 (bad road)	Primary school in village. 96 percent enrolment rate.	No health/services. Private health workers available in village
Krasaing	Next to National Road 5 (bad road)	Primary school is 1 km away from village.	District referral hospital is 3 km away from village
Khsach Chiros	No clear road access (flooded for six months, waterway more used)	Two-room primary school up to Grade 2 in village which stretches 8 km. 54 percent enrolment rate.	No health/services. Private health workers available in village
Mekong Plain			
Prek Kmeng	Earth road (flooded for six months), 2 hours from Phnom Penh	Primary school in village. 90 percent enrolment rate.	No health/services. Private health workers available in village
Babaong	Next to National Road 5 (bad road)	Two primary schools in village. 80 percent enrolment rate.	No health/services. Private health workers available in village
Plateau			
Kanhchor	On the Mekong, difficult road access	No school; nearest school about 3 km away. 80 percent enrolment rate.	No health/services
Dang Kdar	Earthen road access 80 km from National Road 6	Two-room primary school up to Grade 3 in village which stretches 8 km. 44 percent enrolment rate.	No health/services. Private health workers available in village.
Trapeang Prey	Earthen road, 2 hours from Phnom Penh	No primary school but one room pre-school in village. Nearest school is 4 km away. Enrolment: n.a.	No health/services. One private health worker available in village.
Coastal			
Kompong Thnaot	Next to National Road, 20 minutes from Kampot town. Access good	Primary school in village. 70 percent enrolment rate.	No health/services. Two private health workers available in village

2.4. Household Characteristics

2.4.1. Age, Sex, and Marital Status

Well above half the population in all nine villages are younger than 20 years of age. Other than in Babaong, the nine years or less age group accounts for a quarter or more of the population. Seen in a demographic perspective, for every person in the working age group, there is more than one person dependent on that earning. This hugely skewed age distribution towards the younger age groups, (which has been adequately observed in the census as well), is an important reason for incomes, per capita, staying low. At the same time, the small number of people in the upper age groups, (40 years and above and particularly 55 years and above), suggest that there could be many younger people without living parents. This data also indicates that the work span of adults is presently significantly less than the usually expected 35–40 years, which in turn implies lower lifetime incomes of the working people.

Analysis on distribution of the population by sex and village revealed more females than males. In Khsach Chiros, there was a very slight deviation from the norm with 50.8 percent males compared to 49.2 percent females. The sample therefore reflects the nation-wide sex distribution in the country shown by the census and other socio-economic surveys.

The data collected also revealed that young people married late in all of the villages. This seems to contrast to the rural population in countries of similar socio-economic development — at least for these nine villages. Despite this, the total fertility is high. Next, the widow and widower population is large: the proportion in the total population is well above a quarter. The widow/widower proportion is very high in the age group 46 years and above, almost certainly a legacy of previous wars.

2.4.2. Length of Stay and Type of House

There are wide variations in the length of stay of the villagers in the present villages. For example, if 1989 is taken to be a yardstick of the length of stay — the time when agricultural lands were formally redistributed — a majority of households in eight out of the nine villages (other than Andong Trach) have been staying in the villages longer than 1989. Andong Trach appears to have received a large number of returnees and resettlers after the Paris Peace Accord of 1992. This data, however, has to be read with caution since comparison across villages on the length of stay could be influenced by the age distribution of the population in the village.

The average *physical* dimension of a house is 16 m² in Andong Trach and 48 m² in Kanhchor, though the central tendency appears to be towards 30 m². There appears to be no clear association between the physical size of a house and other variables. All that can be suggested *a priori,* is that variables like the availability of land, the period when the household came to settle, and affordability, all play important roles. Next, a majority of the houses in five out of the nine villages have thatched roofs. Tin roofs come next, followed by tiled roofs. Only in Krasaing are houses made out of cement and concrete in sizeable numbers.

2.4.3. Literacy, Education and Work Participation

The percentage of population aged 7 years and above who are not able to read and write, ranges from a low of 21 and 23 in Kanhchor and Babaong respectively, to a high of 52 percent in Dang Kdar. In the other villages, an average 40 percent of the population is illiterate. A majority of these literate can just about read and write; there are few who have completed primary school and fewer who have completed any higher grade.

Labour participation in this sample is high in absolute terms. This is despite the fact that so many persons fall in the very young age groups. Research revealed that almost 50 percent

of children aged 13–17 were involved in some form of work, even if they were studying. Chapter 8 discusses this in further detail.

2.5. Summary

This chapter provides the criteria for selection of the sample that was studied, and the sample's characteristics. The focus of the whole exercise was to obtain a village-level profile rather than a country-level representation. However, the sample shows the usual demographic and socio-economic characteristics found in other socio-economic surveys and the census, thereby suggesting that these households are not atypical of rural Cambodia. The high similarity between these data sets, and those seen in the different socio-economic surveys pertaining to the late 1990s, suggests that it is possible to generalise some of the results of this survey for the whole of rural Cambodia.

Chapter Three

The Process of Land Acquisition and Landlessness

After the privatisation of land, farmers came to acquire land through a variety of means, and most managed to get some land. However, since land has systematically exchanged hands often more than once in the previous decade, it is clearly not an inalienable, non-tradable asset as land is in some agrarian settings. Land markets are active, and both farmers and non-farmers participate in land acquisition and disposal. This chapter examines the following questions:

1) How do farmers acquire agricultural land?
2) How do farmers lose lands; and consequently what is the landless situation?
3) What is the extent of inequality in land distribution?
4) How critical is land in determining people's livelihoods?

This chapter first explains the processes by which farmers have acquired land since the 1980s. It then examines how some farmers lost land, and similarly how land concentration began to find roots under the new market regime in the 1990s. The extent of landlessness resulting from market transactions, as well as the demographic pressures, are discussed in light of factors relating to both demand and supply factors. Finally, it is examined whether, and to what extent, landlessness matters in the context of income generation and standards of living.

3.1. Land Acquisition, Sales and Landlessness

In the 1980s, land was redistributed to rural households in established communities in an egalitarian manner. Those who continued to stay in border camps until 1989 and after, however, did not necessarily get land from this distribution. In the early 1990s, after land trade was formally permitted, agricultural landlessness in rural Cambodia was estimated to be around 5 percent (Williams 1999). According to the Socio-economic Survey (SES) conducted in 1997, landlessness was estimated to be about 12 percent in that year. It rose to about 16 percent in 1999 according to the SES of 1999, a 4 percent increase in two years. If landlessness is rising at 2 percent each year (as seen from the two SES data sets), landlessness should have been 20 percent in 2001. In the present sample of nine villages, landlessness was indeed revealed to be around 20 percent in 2001, though this may be a coincidence.

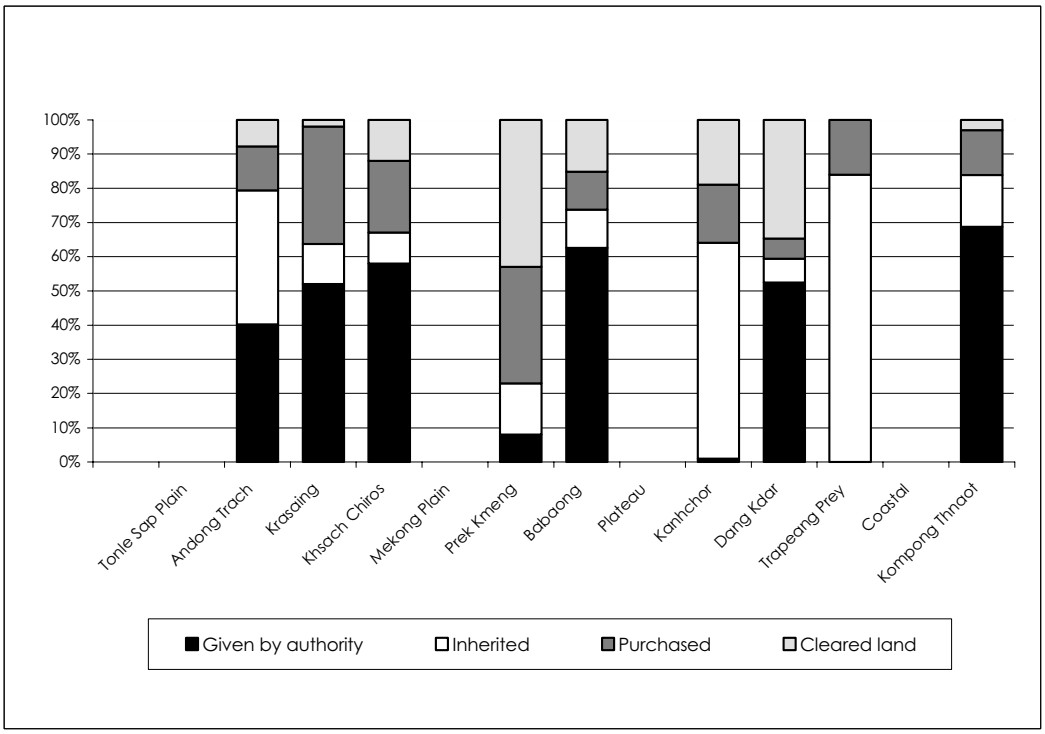
3.1.1. Land Acquisition

Before examining the reasons for landlessness, it is prudent to examine how people acquired land following its redistribution in the 1980s. Figure 3.1 shows quite a diverse combination of ways by which rural households acquired agricultural land. At the outset, it must be noted that the data here captures how people acquired the plots of land that they *were still holding* at the time of the survey. Details of the plots they had sold or subdivided earlier are not known. For instance, in certain villages, a few households acquired land by clearing inundated forests.

They later sold the plots to the current holders, who now report that they have acquired land by *purchase*; the earlier history of land clearing is unreported.

On aggregate, about 44 percent of the plots owned by households in the sample villages were acquired through the land redistribution of the mid-1980s (Figure 3.1). Sixteen percent of the plots were acquired through clearing land of forest and undergrowth. It was seen that an average 60 percent of plots owned by the households in 2001 had not yet changed hands, while 40 percent of existing plots found new owners, either through inheritance (24 percent) or through purchase (16 percent). Inheritance is likely to have resulted in subdivision of plots in the face of a high rate of population growth in the past two decades. Purchasing could mean that the sellers were reduced to being owners of smaller plots after they had sold some of their land or rendered totally landless if they sold all their land.[13]

Figure 3.1. Type of Land Acquisition (by percentage distribution of agricultural plots)



In stable, established villages such as Kanhchor and Trapeang Prey, villagers view their present holdings as obtained through inheritance rather than given by the state. This is because the lands they (or their families) had owned before 1975 were redistributed back to them in the 1980s. Acquisition of land through purchase is high in Krasaing and Prek Kmeng. More than a third of the plots currently held in 2001 in these villages were purchased from other households and this high turnover in land could be one of the results for landlessness in these two villages. In Prek Kmeng as well as Dang Kdar, more than one third of the plots held by households were acquired by clearing public lands. Each of these villages has undertaken different types of land clearance; in Dang Kdar villagers cleared forests surrounding the village while in Prek Kmeng villagers cleared inundated forests.

[13] Totally landless households do not only comprise those who have sold all their lands, but as discussed later, include many new households that either had no land to inherit, or no means to purchase it.

Table 3.1 shows that land was acquired in different ways at different times. The state had mainly completed its land redistribution by 1989, except in the Tonle Sap region where 15 percent of the plots were given out between 1990 and 2001. This region received the largest number of returnees, some of who were given land by the state upon their return. In regions that have higher proportions of high quality agricultural land, namely in the Tonle Sap and Mekong Plain, inheritance as a method of land acquisition continued to be relatively high until recently. In the Plateau region, by contrast, a region where high quality agricultural land is not abundant, only 14 percent of total plots were transferred through inheritance between 1996 and 2001.

In the Tonle Sap region, about a quarter of the plots were purchased as early as 1989 or earlier. In the Mekong region, this proportion is 33 percent and in the Plateau region, 44 percent. The Coastal region shows this to be less than a fifth. It is widely reported in other studies as well, that land purchases/sales have been high in most regions for some time (Chan and Acharya 2002).

Most of the land acquired through clearing inundated forests was acquired before 1990 in the Tonle Sap, Mekong and Coastal regions, while the case is opposite in the Plateau region. The pressure to clear (non-inundated) forest is high in Dang Kdar and Kanhchor.

Table 3.1. Percentage Distribution of Agricultural Land Plots to Total Agricultural Land (by date of acquisition by current owners).

How was the plot acquired?	When the plot was acquired*			
	1989 or before	1990 – 1995	1996 – 2001	Total
Tonle Sap Plain				
Given by authority	84	8	7	100
Inherited	55	10	35	100
Purchased	25	44	31	100
Cleared	64	19	17	100
Total	64	18	18	100
Mekong Plain				
Given by authority	99	1	1	100
Inherited	46	32	21	100
Purchased	33	28	39	100
Cleared	78	11	11	100
Total	75	12	13	100
Plateau				
Given by authority	96	1	3	100
Inherited	72	14	14	100
Purchased	44	15	42	100
Cleared	30	10	59	100
Total	66	10	24	100
Coastal				
Given by authority	99	0	1	100
Inherited	49	43	8	100
Purchased	19	23	58	100
Cleared	89	0	11	100
Total	82	9	9	100

** Percentage of plots that were acquired by their present owners.*

3.1.2 Land Sales

Table 3.2 presents the incidence of land sales since 1989, when private ownership of land and therefore sales, were formally permitted.[14] While on aggregate 12 percent of the total households surveyed reported that they had sold land, the difference between regions is considerable. The highest proportion of households that sold land was in the Tonle Sap Plain at 16 percent, whereas only about 8 percent of the households in the Plateau region have sold land. In between these two, are the Mekong and Coastal regions where 12–13 percent of

[14] In fact as noted above, a few plots were reportedly bought earlier than 1989. Because of potential lack of clear recall by participants, 1989 was used as a point of reference.

households have sold land since 1989. The highest incidence of land sales has been recorded in Krasaing where 24 percent of the households have sold land. This could partly be why the village has the second highest incidence of landlessness (second only to Andong Trach).

There is also a contrast across the regions between the sizes of land plots sold. In the Tonle Sap Plain, the average size of land sold is around 1 hectare, compared to only 0.2 of a hectare in the Plateau region. This size differential is apparently related to the availability of arable land in each of these regions. The largest average size of land plots sold was in Babaong, which is relatively well endowed with large rice land. It could be suggested that Babaong exhibits this characteristic simply because the land plots are bigger there than in many other villages.

Table 3.2. Land Sales Since 1989

	Percentage of households who have sold land	Average Size of Land sold (ha)	Standard deviation of sizes of land sold
Tonle Sap Plain			
Andong Trach	12	1.17	0.53
Krasaing	24	0.90	0.53
Khsach Chiros	10	0.95	0.44
Mekong Plain			
Prek Kmeng	12	0.50	0.49
Babaong	13	1.48	2.20
Plateau			
Kanhchor	6	0.10	0.06
Dang Kdar	9	0.24	0.14
Trapeang Prey	7	0.32	0.16
Coastal			
Kompong Thnaot	13	0.16	0.07
All Villages	**12**	**0.66**	**0.82**

Note: Land sales in this table include both residential land and agricultural land, though the latter accounts for a majority.

Since agricultural landlessness has become a pressing problem, reasons why people sell their land are widely discussed in Cambodia. Oxfam (GB) conducted a survey on landlessness in more than 100 villages and found that 45 percent of the households who "had land but later lost it", sold all their land to meet excessive expenditure on illness. While the study indicates that the state of (poor) health is critically responsible for the high rate of landlessness (Biddhulph 2000), it could be suggested that health problems are not the only primary cause of landlessness. Alternatively, it can be argued that it is *poverty or inability to pay* for health treatment that forces the poor to sell their land (Chan, Tep and Acharya 2001).

Table 3.3. Main Reasons for Selling Land Plots (by percentage distribution of households who sold land).

	Number of households who have sold land since 1989	Percentage of households who have sold land since 1989
To pay for health treatment	57	50
To pay debt	14	12
Need money to do other business	10	9
Need money for consumption	9	8
A household member died	7	6
The land was too small to crop	4	3
To migrate from the village	4	3
To change job	1	1
Other	9	8
Total	**115**	**100**

In this survey, respondents were asked to provide one main reason why they sold some or all of their land. Up to 50 percent of the households who sold land since 1989, stated that they needed money to meet expenses on illness in the family (Table 3.3). Among the other 50

percent of households who have sold land, 12 percent did so to pay debts, 9 percent to do other business, and 8 percent to meet consumption needs.[15]

3.1.3. Landlessness

Table 3.4 provides estimates of landlessness and its relationship with other related variables. The table shows that households without homestead plots are relatively high in most of the nine villages averaging 12 percent. As indicated in this survey, many households, especially those formed after 1989, do not own any homestead lands. The most frequently cited reasons why some households do not own any land for constructing their homes are that they were internally displaced, or that they were newly formed. Selling land is not a major reason. Being without residential land can be a major indication of poverty. This survey finds that those households who do not own any homestead land are far worse off in terms of both assets and income than those who do.

At the aggregate nine-village level, the table shows that 20 percent of the households do not own any agricultural land; this ranges from a low of 7 percent in Babaong and Dang Kdar, to 38–39 percent in Krasaing and Andong Trach. Agricultural landlessness in Prek Kmeng (31 percent) and Kanhchor (29 percent) is well above the average.

It could be suggested that the extent of landlessness depends on the price of land, productivity and availability of land (demand side factors), in addition to the desperation of selling land for meeting pressing expenses (supply side factors). For example, people can be attracted by the high price of land, and therefore, sell it to meet their demand for cash. Next, if the land is productive, there is high demand for it, which in turn tends to raise its price and attract a demand-led inducement to sell land.

Table 3.4 shows a clear positive association between land productivity and the price of land. Except in Kompong Thnaot (where land is expensive because of it being close to the coast), the other villages provide evidence that high rice yield generally keeps the land price high. In the villages of Battambang Province (Andong Trach and Krasaing), expensive and exclusive rice varieties can be grown; therefore, the price of land is high. In contrast, a hectare of land yielding around 1.5 tonnes of ordinary paddy is priced in the range $80–200 (Dang Kdar, Khsach Chiros, Trapeang Prey).

Does high productivity implying market surplus, a higher degree of commercialisation, and high price of land, induce households to sell land? There is a positive association between the three variables — land productivity, land price, and landlessness — in seven out of the nine villages. In Andong Trach, Krasaing, Prek Kmeng, and Kanhchor, the price of land is high, and so is landlessness (above 30 percent). In Khsach Chiros and Trapeang Prey, both land price and land productivity are low, as is landlessness. For the sample of seven villages, the coefficient of correlation[16] between the extent of landlessness and rice productivity is 0.62, while the correlation coefficient between the extent of landlessness and land price is 0.93.

---

[15] The logic of losing land in each of the reasons mentioned here can be traced to inability to hold on to the land, since the present incomes (from land and elsewhere) are too little to either pay for health costs or service debts, or even to meet consumption needs. Hence, while incurring excessive expenditure on illness is an important *process* through which land is lost, inadequate income derived from land and other sources, in contrast to expenditure, is evidently the *cause*. This argument is followed up later in this paper.

[16] When the correlation coefficient is equal to one, the two variables are perfectly correlated (positively).

Table 3.4. Landlessness and Related Variables

Village	Without homestead (Percent households)	Agricultural landless (Percent households)	Agricultural land price (US$/ha)	Rice yield (tonnes/ha)	Availability of agricultural land (ha/5 persons)
Tonle Sap					
Andong Trach	7	39	545	2.2	2.8
Krasaing	18	38	619	2.0	0.9
Khsach Chiros	17	9	89	1.5	1.9
Mekong Plain					
Prek Kmeng	17	31	292	3.5	0.8
Babaong	6	7	480	3.3	1.4
Plateau					
Kanhchor	15	29	400	3.0	0.4
Dang Kdar	5	7	128	1.6	0.5
Trapeang Prey	25	12	214	1.2	0.5
Coastal					
Kompong Thnaot	3	8	747	1.5	0.4
All villages	**12**	**20**	**390**	**2.2**	**1.2**

The relationship between land productivity, land price and landlessness are different in Babaong and Kompong Thnaot. In Babaong, both rice productivity and land prices are high, while landlessness is amongst the lowest (7 percent). Villagers in this village almost totally depend on rice cultivation, so land is a necessary asset and most households try to hold on to it. Kompong Thnaot is one of the only villages in Kampot Province where people build their houses in the middle of their agricultural land. Since agricultural landlessness could also imply homelessness, people hold on to some land.

With respect to the availability of agricultural land to households in the villages, data suggests that even if agricultural land were divided equally, each household would get no more than 2 hectares. This suggests that the supply of land in these villages is not very high. Nonetheless, there are indications of a relationship between the availability of land and the degrees of landlessness. With the exception of Andong Trach, less availability of land per household in the village is associated with higher landlessness (Krasaing, Prek Kmeng, and Kanhchor). In Khsach Chiros and Babaong where the supply of land per household is relatively high, landlessness is lower. The exception is Andong Trach. The supply of land in this village is the highest (2.8 hectare/household), but landlessness is the highest as well. This village had to resettle about 100 households returning from border camps in the early 1990s, by which time the first land distribution was complete. Consequently, land is quite unequally distributed in this village.

Finally, the extent of landlessness appears to be related to other livelihood alternatives. In Prek Kmeng, the high rate of landlessness (31 percent) does not seem to significantly affect livelihoods, as people depend primarily on fishing. A similar example is Krasaing (38 percent landlessness) where earnings from CPR and migration for work to Thailand provide a large share of total income. In these two villages, people may be exercising some choice as to whether they hold on to land, especially if it is of a non-viable size.

Table 3.5 below, presents the reasons given by the households as to why they are landless. Of all the landless households in the villages, 18 percent became landless because they had sold all their land, 7 percent because they had given their land plots to their offspring, 38 percent because they had never owned any land (mostly new families), 33 percent because they were returnees or internally displaced persons, and 4 percent because of other reasons.

Among the landless households, an aggregate 18 percent became landless because they sold all their land. This is equivalent to 4 percent of all households. This does not mean that only 4 percent of all households have been involved in land sales. In fact, as indicated in

Table 3.2, about 12 percent of households in the nine villages have sold land since 1989. They are still landowners, however, having sold only part of their holdings or by acquiring other plots in lieu of the sale.

At least 7 percent of the landless have no land because they had given all their land to their family. Other households have given part of their land to their children (subdivision). As noted above, 24 percent of the landowners acquired their present land through inheritance. The fact that 38 percent of the landless households have never had land, and are mostly younger households, clearly indicates the high demographic pressure on land.

In Andong Trach village, almost all the landless households are landless because they are resettlers returned from border camps. In fact, they reported that they were given land plots by the state for their resettlement but lacked the means to cultivate them. Other households who possessed the means eventually purchased these land plots for a price from returnee households.

Table 3.5. Reasons for Agricultural Landlessness (by percentage distribution of households)

Region / Village	Sold All Land	Gave Land to Children	Never Had Land	Returnees/ IDPs	Other Reasons	Total
Tonle Sap						
Andong Trach	6	0	0	94	0	100
Krasaing	37	7	24	26	7	100
Khsach Chiros	17	0	67	17	0	100
Mekong Plain						
Prek Kmeng	16	3	65	14	3	100
Babaong	22	11	44	11	11	100
Plateau						
Kanhchor	3	9	65	18	6	100
Dang Kdar	13	38	0	50	0	100
Trapeang Prey	38	13	13	25	13	100
Coastal						
Kompong Thnaot	8	17	58	17	0	100
All Villages	**18**	**7**	**38**	**33**	**4**	**100**

Seen village-by-village, the situation varies. Data shows that 37 percent of the landless households in Krasaing and 38 percent in Trapeang Prey sold land and become landless. In Krasaing, 24 percent of the landless never had land and 26 percent have lost land due to displacement. In Prek Kmeng and Kanhchor, where there is high landlessness, 'never had land' is the most commonly cited reason why households are landless. This reflects the relative scarcity of land in these locales. Only five households in all nine villages reported that they had lost land due to land grabbing by others (Appendix 3, Table 1).

Chan and Acharya (2002) found that a large number of households have subdivided their lands and now have smaller holdings. Since the population is increasing at a rate of 2.5 percent per year, subdivision of lands and landlessness are inevitable if land boundaries do not expand.

To conclude, it must be stated that people lose land or become landless because of more than one reason. For one, many are not able to retain lands because they do not earn enough from them. Pressing demands for cash, due to both routine as well as unexpected (particularly illness related) expenses, therefore force them to sell their land. Next, the smallness of land plots due to atomisation reduces their usefulness and induces people to sell the land. Third, in some cases, farmers are persuaded to sell their lands as land buyers offer attractive prices; thereafter they look for alternative livelihood options. Lastly, some are landless because they never had land.

3.2. Land Conflicts

For the nine-village sample, only 6 percent of the households have had one or more land conflicts since 1989 (Table 3.6). The prevalence of conflict over land, therefore, does not appear to be that high according to this research. Krasaing has had no land disputes. Next, only one household in Trapeang Prey has experienced land conflict. Babaong, which is the largest village, has had the highest number of households (13 percent or 16 households) experiencing land conflicts; of these, seven households had conflicts relating to agricultural land. Overall, most of the conflicts were on residential land except in Andong Trach and Khsach Chiros. In Andong Trach, 4 percent of the households have had land conflicts, all of which related to agricultural land, while in Khsach Chiros, six of the eight conflicts were on agricultural land.

Table 3.6. Incidence of Land Conflicts and the Type of Land Involved in Conflicts

	Percentage of households that have had land conflicts	Type of Land in Conflict (Number of households)		
		Residential	Agricultural	Total
Tonle Sap Plain				
Andong Trach	4	-	3	3
Krasaing	0	-	-	-
Khsach Chiros	8	3	6	9
Mekong Plain				
Prek Kmeng	8	9	1	10
Babaong	13	9	7	16
Plateau				
Kanhchor	9	8	3	11
Dang Kdar	8	7	3	10
Trapeang Prey	1	-	1	1
Coastal				
Kompong Thnaot	3	3	1	4
All villages	**6**	**39**	**25**	**64**

For the whole sample, (See Appendix 2, Tables 1, 2 and 3) the highest number of conflicts relates to land boundaries (26 households), followed by disputes with relatives, and then disputes with non-relatives (15 households each). Only one household reported conflict due to land grabbing by soldiers or powerful officials and four households reported authorities had grabbed land[17] (one case each in Andong Trach, Khsach Chiros, Prek Kmeng, Kanhchor, and Kompong Thnaot). In Babaong, where the conflicts have been the highest, the majority of the households involved have faced boundary problems; there were no reports of conflicts with either the authorities or soldiers and powerful officials.

The number of land conflicts that were resolved and those that were not resolved was also examined. Of all the households reporting land conflicts, 20 households (or 31 percent) had yet to settle them; 16 (or 25 percent) settled them through a compromise; 21 (or 33 percent) found solutions at the commune level; and two households had their conflicts decided in provincial courts (Kompong Thnaot).

Among households that had their land conflicts resolved, 39 households (60 percent) did not lose any land, 20 (32 percent) lost some land, and 5 (8 percent) lost all land.

3.3. Distribution of Agricultural Land Holdings

Table 3.7 presents the distribution of households owning agricultural land by different sizes, or no land at all, and inequality of land ownership. Altogether, in the nine villages, 20 percent of households are landless, 25 percent hold 0.5 hectare or less, 20 percent hold between 0.5

[17] 'Authorities' are differentiated from the 'Soldier/Powerful Official' category as the former would be a civil authority and the latter armed.

and 1 hectare, 20 percent hold between 1 and 3 hectares and 10 percent hold more than 3 hectares. Those having land holdings of 0.5 hectare or less can be classified as 'near landless'. As will be discussed below in terms of earnings, this group could be no better off than the landless; in fact, they generate less income than the landless do. In this context, therefore, 45 percent of households (almost half) are landless or near landless. This amount of landlessness and near landlessness is the reason why so many households rely on non-farm sources of income in rural areas, contrary to the popular view that almost all in rural Cambodia are rice farmers. This is discussed further in Chapters 5 and 8

Across the four agro-climatic regions, the Tonle Sap Plain has the highest inequality of land holdings. Andong Trach and Krasaing each have the highest percentage of households owning no land, and at the other end, a relatively high proportion of households owning land plots of sizes more than 3 hectares. The Gini coefficients of inequality for land distribution in these two villages are 0.63 and 0.65, respectively: higher than the sample average. The average size of land holding in these two villages is 2.3 hectares each, again higher than the all-village average. Another village in this region, Khsach Chiros, has 29 percent of its households owning more than 3 hectares of agricultural land, by far the highest proportion in the sample. The average land holding per household is 2.8 hectares, also the highest in the nine villages. The Gini coefficient of land distribution in this village, however, is 0.51, which is *below* the sample average. These data reflect the relative land abundance in this remotely located village.

In the Mekong Plain region, the two villages exhibit contrasting patterns of land ownership. In the fishing village of Prek Kmeng, the majority of those who own land own no more than 1 hectare. Due to significant landlessness, the Gini coefficient is high at 0.65 in this village. Since a few households own more than 3 hectare each, the average landholding per landed household is 1.4 hectare. By contrast, Babaong is characterised by relatively high equity in the distribution of land, with the Gini coefficient the lowest in the sample, at 0.41.[18]

Table 3.7. Agricultural Land Holdings (by percentage distribution of households)

Region/Village	Landless	>0–0.5ha	>0.5–1ha	>1–3ha	>3 ha	Total	Average holding per household (ha)[1]	Gini coefficient of land ownership
	(Percent)							
Tonle Sap								
Andong Trach	39	7	13	31	11	100	2.3	0.63
Krasaing	38	12	13	23	14	100	2.3	0.65
Khsach Chiros	9	12	14	36	29	100	2.8	0.51
Mekong Plain								
Prek Kmeng	31	19	22	20	8	100	1.4	0.65
Babaong	7	12	17	54	9	100	1.8	0.41
Plateau								
Kanhchor	29	32	20	15	4	100	1.1	0.69
Dang Kdar	7	46	27	19	0	100	0.8	0.49
Trapeang Prey	12	38	28	21	1	100	0.9	0.45
Coastal								
Kompong Thnaot	8	51	31	8	2	100	0.7	0.47
All villages	**20**	**25**	**20**	**25**	**10**	**100**	**1.5**	**0.57**

[1] *Average land holding per household among those who own land.*

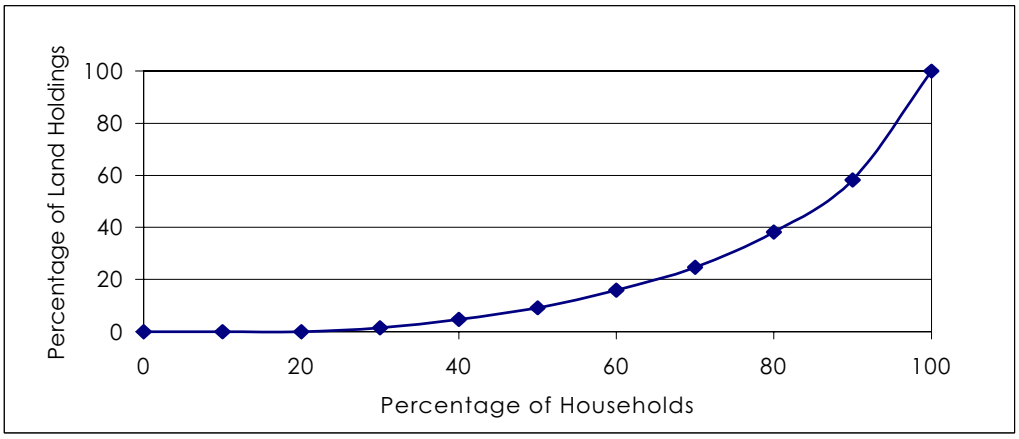
In the Plateau and Coastal regions, where compared to elsewhere the availability of agricultural land is low; the distribution of land holdings is much more equal, except in Kanhchor village where the Gini coefficient is 0.69.

[18] A Gini coefficient can assume a smaller value if the numbers of landless are fewer, even if land inequality is very high. Consequently, sole reliance on the value of Gini coefficient is not advisable.

In two villages (Dang Kdar and Kompong Thnaot), though landlessness is not very high, the landed households each own less than 1 hectare on average, with about half the households owning 0.5 hectare each or less. The incidence of 'near landless' is high in these villages. The inequality coefficients in each of these villages are less than 0.5, which is well below the average.

Figure 3.2 below presents the Lorenz Curve of inequality, indicating how unequal the distribution of land in the nine villages is. While 20 percent of the households (at one end) do not own any land, the top 20 percent own about 60 percent of the land. To be more specific, the top 10 percent with largest land holdings own about 40 percent of land, while 50 percent at the other end of the scale own less than 10 percent land. Inequality is therefore high. While there are no feudal-style property owners in Cambodia, as in some other parts of the world, Cambodia's agrarian system can only deteriorate with a rising inequality in land ownership.

Figure 3.2. Lorenz Curve of Agricultural Land Holdings



3.4. Land Tenancy

In reality, many factors determine the incidence of land tenancy. Land tenancy can be one of the options used by the landless or those owning inadequate land to improve their livelihood strategies. At the same time, those owning more land than their production capacity gain by renting out their excess lands. Among other factors, the productivity and profitability of cultivating hired land compared to earning livelihoods from other jobs could also influence the extent of tenancy.[19]

This survey did not reveal that land tenancy was high. Part of the reason for the low incidence of land tenancy might be the lack of secure tenure, as most plots are not yet registered. Only 7.4 percent of the total households in the nine villages rent land plots. The average size of a rented land plot is about 1 hectare. Table 3.8 shows that more than 10 percent of the households (greater than average) in Andong Trach, Prek Kmeng, Babaong and Kanhchor have to rent land. Babaong recorded the highest amount of rental land (15 percent). Having to rent land, to whatever extent it exists, is therefore positively associated to land productivity and landlessness. In all the above four villages, rice yields are relatively high, and other than in Babaong, landlessness is high. In contrast, land tenancy is small in Khsach Chiros, Dang Kdar, Trapeang Prey, and Kompong Thnaot, where both land productivity and

[19] Despite these arguments, land use under tenancy has been found to be sub-optimal in most countries. This is because the users have no incentive to invest in land, when it is not their own. It is not clear, though, whether this would also hold for Cambodia.

landlessness are low.[20] These statistics also suggest that the landless hire land and that to some extent, the institution of tenancy is an equaliser in Cambodia.

Table 3.8. Land Tenancy and Average Rental Size (by distribution of households)

	Rent In		Rent Out		Landlessness incidence	Rice yield (tonne/ha)
	Percent of total households	Average size (ha)	Percent of total households	Average land size (ha)		
Tonle Sap						
Andong Trach	10.6	1.89	1.2	0.50	39	2.2
Krasaing	5.8	1.95	3.3	2.25	38	2.0
Khsach Chiros	3.3	0.48	0.0	-	9	1.5
Mekong Plain						
Prek Kmeng	13.3	0.44	3.3	1.83	31	3.5
Babaong	15.0	1.18	7.1	0.81	7	3.3
Plateau						
Kanhchor	11.7	0.53	9.2	0.31	29	3.0
Dang Kdar	3.2	0.34	3.2	0.28	7	1.6
Trapeang Prey	1.5	1.50	0.0	-	12	1.2
Coastal						
Kompong Thnaot	0.0	-	0.8	2.00	8	1.5
All villages	**7.4**	**0.98**	**3.4**	**0.90**	**20**	**2.2**

The number of households who rent land in, and the number renting land out, need not be the same. For one, a household may own a number of plots and rent them out to more than one household. This is probably the case in Prek Kmeng. For another, some households may rent land in from (or rent land out to) households not living in the village. Besides, it is likely that households renting out land conceal this fact. This is because most farming families do not wish to reveal the fact that they are unable to till the land, or possess surplus land, lest the authorities or even others in the community pose a threat to their lands. This phenomenon has been noted in other countries as well (Singh 1988).

3.5. Land and Other Assets

Comparing assets of the landless and landholders of different land sizes can partly answer the question whether, and to what extent, landlessness matters in determining the standards of living. This is because other assets can generate incomes and livelihood as well. Apart from land, assets include the residence, machinery, transport, farm tools, and other durables.[21] Figure 3.3 provides an indication for these. It could be concluded from this data that the larger the land that households own, the more assets they possess in terms of both total assets and non-farmland assets. [22] In every village, households owning more than 1 hectare of land have far more assets than those owning less than 1 hectare of land do. There is a clear distinction to be seen between households owning more than 3 hectares of land and others. Exceptions are only found in three villages, Prek Kmeng, Babaong, and Kanhchor, where the landless have larger non-farmland assets than the small landholders. This is because some wealthy households in Prek Kmeng and Kanhchor earn their living out of fishing and a small number in Babaong rely on trading; they are not farmers.

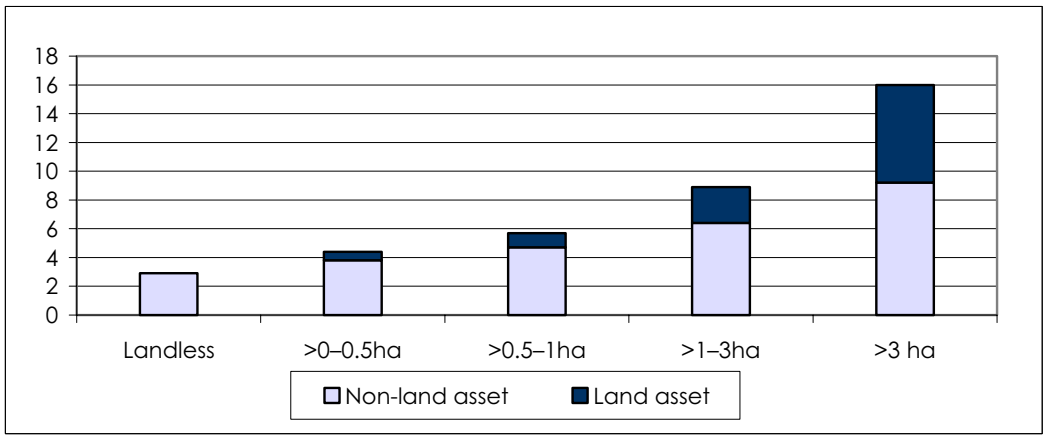
[20] Low tenural security and active land markets (found earlier) are not contradictory. People may hesitate to *lend* their lands; but a permanent transfer is a different matter.

[21] It may be stated though that not all these assets would generate incomes.

[22] Assets other than land include houses, animals, transports and other durable goods. Financial assets are not included in this calculation because it cannot be assumed that people would reveal their true financial assets.

This suggests that land and other assets are generally complementary, and are not a substitute to each other. Those who own more of one, also hold more of the other, and vice-versa.

Figure 3.3. Household Assets by Land Holdings (million riels)

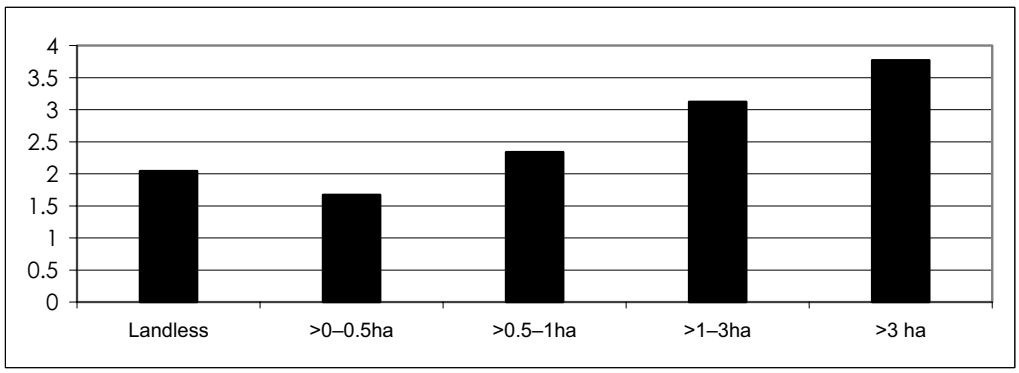


3.6. Land Holdings and Income

The landless do not necessarily earn the lowest income. Except in Babaong, the landless earn about the same income as those who possess land plots of sizes smaller or equal to 0.5 hectares (Table 3.9 and Figure 3.4). In Andong Trach and Krasaing, the landless earn considerably more income than the small landholders do. In some cases, even landholders of land plots between 0.5 and 1 hectare do not earn *significantly* more income than the landless. As stated earlier, part of the explanation lies in the fact that many landless are not farmers at all: they earn incomes from fishing or trade.[23]

If landlessness is a concern, there should also be a concern for the near landless (owning 0.5 hectares or less), who constitute about 25 percent of the total households in this sample.

Figure 3.4. Mean Annual Household lincluding Personal Crop Production (million riels per year)



[23] There may appear to be a bit of contradiction between the complementarity of assets found earlier and this statement. In reality, while landholders are also asset owners, not all asset owners need be landholders as well.

Table 3.9. Mean Annual Income, Including Personal Crop Production (million riels)

	Grouped Land Holdings per Household				
	Landless	**>0–0.5ha**	**>0.5–1ha**	**>1–3ha**	**>3 ha**
Tonle Sap					
Andong Trach	2.05	1.51	1.88	2.82	2.91
Krasaing	2.64	2.00	3.36	3.28	3.37
Khsach Chiros	1.13	1.19	1.15	1.76	2.69
Mekong Plain					
Prek Kmeng	2.55	2.53	3.48	5.47	5.26
Babaong	2.46	3.27	2.99	3.69	7.34
Plateau					
Kanhchor	1.31	1.40	1.40	3.00	3.24
Dang Kdar	0.86	1.02	1.18	1.78	
Trapeang Prey	0.99	1.02	1.59	2.53	3.15
Coastal					
Kompong Thnaot	2.39	2.07	3.50	3.96	2.85
All villages	**2.04**	**1.67**	**2.34**	**3.12**	**3.77**

The landless obtain the least income from agriculture but they earn more income than any other group, in both absolute and relative terms, from self-employment in other activities, hiring out labour, and from CPR — mainly fishing and foraging. (Full household income figures are indicated in Appendix 2, Table 5). Their livelihood critically depends on paid employment and CPR. It follows that if off-farm and non-farm employment can be expanded and CPR managed in a more sustainable way, the incidence of landlessness could be of less importance to people's livelihoods. (This is discussed in detail in Chapter 6)

3.7. Summary

Following the land redistribution in the middle of the 1980s and the reintroduction of private ownership of land in 1989, land markets began to evolve in all nine of the villages studied. By 2001, 44 percent of the landholders reported that their land was from the state, 24 percent reported that they inherited it, 16 percent reported they had purchased, and 16 percent reported they had cleared forest to claim the land. In villages that have access to forest (including inundated forests), land clearance is still occurring.

Twelve percent of the sampled households reported that they have sold some or all of their land since 1989. Half of them reported that this was to meet health expenses. Next, 18 percent of those who have become landless said that they sold all their land, while 38 percent of the landless have never owned land. It was also found that productive land plots exchange hands faster.

Among the landholders, an average household owns 1.5 hectares of agricultural land. However, the average does not convey much because the distribution of land ownership is highly unequal. Twenty percent of households own no land, 25 percent own 0.5 hectare or less, while the top 10 percent owns 40 percent of the land.

Does landlessness matter? Yes, to an extent it does. Survey data indicate that the majority of landless households have fewer assets and earn lower incomes than landholders, and the reverse holds as well. In addition, near-landlessness is a serious problem. However, it is also partly true that some do not belong to the farming community at all, and they earn their livelihoods from trade, fisheries, or other occupations. They earn reasonable incomes. Land matters to those whose principal occupation is farming, and without farms, their livelihoods are in jeopardy. It is therefore a cause of concern if farmers unwillingly or out of choice, lose lands and consequently become destitute.

Chapter Four

Farm Productivity and Cost of Production

Crop productivity in Cambodia is among the lowest in the Southeast Asian region. Crop yields were always low — for example, when in the 1960s and 1970s, Taiwan, Korea, the Philippines, or Indonesia were reaping rice productivity yields in excess of 3–3.5 tonnes per hectare, Cambodia never exceeded 2 tonnes. The reason why Cambodia was able to export food in the 1950s and 1960s lay in a combination of factors like low population density and excessive taxation of agriculture.

The population in the 1990s has increased by more than two to three times since the 1960s. With little occupational diversification, most of this population has been absorbed within the agriculture sector itself, despite the fact that the area cultivated in the late 1990s was about the same as that in the 1960s. Currently, over 8 million people (about 1.8 million families) live by agriculture — predominantly subsistence rice farming. Farmers grow crops in the wet season or in the dry season if their lands become inundated during the wet season. Multiple cropping has not yet really developed, as controlled irrigation is still limited to less than 10 percent of the cropped area.[24] In this regard, it can be stated that Cambodian agriculture is still a low input agriculture, largely dependent on the bounties of nature.

Low productivity, a rising population, land atomisation, and high seasonal fluctuations in production in agriculture have all affected food security in Cambodia in recent years (Murshid 1998). In this regard, modernisation of agriculture and land reforms are paramount. The first step in this direction is to understand the nature, productivity, incomes, and costs of agricultural operations.

This chapter aims to examine the following questions:

1) What is the nature of the relationship between farm size and productivity?
2) What is the relationship between the cost of production, productivity, and profitability?
3) To what extent is farm profitability synchronous with productivity?
4) What are the regional differences in these variables?

The pattern of costs, productivity and profitability, and the associations between each of these, are technical relationships that can be more accurately examined with data collected from *farms* rather than *households.* However, since each of these issues is intricately related

[24] The figure on controlled irrigation has been obtained from the Ministry of Agriculture, Forestry and Fisheries.

to rural livelihoods, some preliminary analysis is still attempted despite the fact that the data here have been collected at the household level.

4.1. Farm Size and Productivity

The debate on farm size and productivity dominated literature on land reforms and land economics in Asia for several decades in the latter part of the twentieth-century. The general proposition was that small farms, under the present endowments and means available to farmers, were more efficient than larger ones. If lands were more equitably distributed and in modest sizes, the production would rise, and so would employment and food security.

After considerable analysis of several data sets in many low-income agrarian economies, the literature suggests the following propositions for Asia:[25]

1) Small plots are usually subdivisions of highly fertile lands and therefore are more productive. It has been possible to fragment them economically in the course of inter-generational land transfer; therefore, they are small.
2) Given the spectrum of choices (there are few modern methods presently being put into practice that could reap economies of scale), small farmers use better techniques and exercise superior managerial control.
3) It has often been observed that land under tenancy is poorly utilised. However, there is relatively low incentive to lease out smaller land plots. As they are self-operated, they yield high productivity.
4) Family-labour and other owned (*i.e.* non-priced) inputs are applied more intensively in small farms irrespective of marginal productivity considerations; therefore, the yield rates in small farms are high.
5) The cropping pattern and intensity chosen by small farmers is of higher value and they usually sow more crops in a year than the larger farmers.

How many of these propositions hold for Cambodia? Not much is known, except that not all of them apply in all locales at all times. Research undertaken by Kim, Chan, and Acharya (2002) find that many smaller plots are often *hired out.* This is either because they yield insufficient incomes to sustain the owners families, or because smaller farmers do not necessarily have the means to cultivate them. Hiring out is also facilitated by the fact that the cropping pattern does not change very much in Cambodia: rice is grown in almost all the seasons. In a separate survey of three of the nine villages, however, it was found that under rain fed farming conditions poor farmers earned higher than average net returns, while under irrigated farming conditions — where more modern inputs are applied — poorer farmers earned less than average (Murshid 1998).[26]

In Cambodia, crops are sown in two seasons: the wet season and the dry season. Very large majorities of farmers cultivate rice in the wet season, and fish and forage in the dry season. As stated earlier, farmers who possess lands in low-lying areas cultivate the dry season crop since their lands are inundated in the wet season.[27] By very definition, wet season crops are predominantly rain-fed, while the dry season ones may be partly irrigated. Their economics are very different and therefore in this chapter, wet and dry season crops are examined separately.

---

[25] A succinct discussion on farm size and productivity can be seen in Bhardwaj (1976) and Acharya (1995).

[26] Murshid does not carry out an analysis by farm size. He constructs a composite index to define well being, and land holding is one of them. In a rank of 1–6, the lowest two rungs consist of the 'poor'.

[27] The area under dry season crops is far smaller than that under wet season crops.

Table 4.1. Wet Season (or non-irrigated) Rice Cultivation in 2001 by Farm Size (all villages)

Farm size grouping	Sample farms	Harvested area (ha)	Production (tonnes)	Yield (tonnes/ha)
>0 - 0.5ha	225	0.34	0.56	1.82
>0.5 - 1ha	133	0.84	1.10	1.29
>1 - 2ha	225	1.69	1.84	1.08
>2ha	64	3.99	2.71	0.75
Total	**495**	**1.15**	**1.17**	**1.43**

Table 4.1 contains data based on farm size and productivity for the wet season, a period when the application of modern material inputs in agriculture is relatively low. For the full sample, productivity in the wet season — measured, as the rice-yield (tonnes/ha) — is the highest in the smallest farms, at 1.82 tonnes per hectare. There is a gradual fall in the yield as farm sizes increase and this pattern is seen in seven of the eight villages, (village specific data for Tables 4.1 and 4.2 can be seen in Appendix 3). These data follow the classical explanation suggested for Asia, that smaller farms are more productive. The result is expected since the bulk of Cambodian agriculture still uses traditional, subsistence-oriented cultivation methods. The other possible reason is that better quality lands are split into smaller plots, as is revealed by data on land prices: when measured on the basis of unit area, smaller plots are priced higher than the larger ones. The farm size-productivity relationship in Babaong is somewhat different; the reason for this probably lies in the higher degree of mechanisation and agricultural modernisation there, even in the wet season crop. The pattern in Andong Trach is somewhat indiscernible since its agriculture is not yet modernised.

Table 4.2 provides similar data as Table 4.1 for the dry season rice crop. However, Table 4.2 shows results that deviate from those in Table 4.1. On aggregate, the largest farms have the highest yield, though the difference between the large and small farms is not very high. Only in Khsach Chiros does the inverse relationship between farm size and productivity effectively hold with the smallest farms yielding 1.73 tonnes/ha and the largest only 0.86 tonnes/ha (Appendix 3, Table 2). These results are likely because Khsach Chiros is a remote village where modern methods of cultivation are yet to be introduced, irrespective of the season. Elsewhere, while it may not be the largest farms that have the highest productivity, neither is it the smallest sized farms; high productivity ranges across the sample. Perhaps the farm-size and productivity relationship is disturbed because the dry crop is usually grown under controlled irrigation conditions and farmers practise more modern methods of cultivation and crop husbandry. These arguments are supported by the fact that the absolute yield rates are also generally high in the dry season compared to the wet season.

Table 4.2. Dry Season (or irrigated) Rice cultivation by Farm Size in 2001 (all villages)

Farm size	Sample	Harvested Area per Household (ha)	Production per Household (tonnes)	Yield (tonnes/ha)
>0 - 0.5ha	95	0.33	0.81	2.62
>0.5 - 1ha	70	0.83	2.16	2.65
>1 - 2ha	68	1.61	4.30	2.65
>2ha	44	3.40	9.17	2.69
Total	**277**	**1.26**	**3.33**	**2.65**

In summary, therefore, it appears as if the farm size-productivity relationship holds under conditions of farming that use traditional methods — the wet season crop in this case. It tends to either weaken or break down when modern methods of farming are introduced, during dry season farming. In some sense, these results are similar to the ones put forth by Murshid (1998) and this indicates that there has been little change in the technical relationships in agriculture for the last five years.

4.2. Regional Variations in Yields and Food Availability

Data indicates regional variations in the yield rates (Appendix 3, Table 1, tonnes/ha). For rice cultivated during the wet season, the aggregate yield rate is the highest in Babaong (2.96 tonnes/ha), followed by Kanhchor (2.47 tonnes/ha), and the lowest aggregate yield is in Khsach Chiros (0.90 tonnes/ha). Babaong's agriculture is relatively more modernised, while Khsach Chiros is located in a more remote area. Krasaing shows low productivity despite having modernised agriculture because in the year this survey was launched, there were serious floods, disrupting the wet season crop.

Table 4.1 also indicates that the total rice production, (hence potential food availability) with the smaller landholders is much lower despite higher productivity, compared to larger landholders. This indicates that being efficient does not necessarily guarantee freedom from hunger. Seen in the context of food security at the household level, therefore, small farms are not always the most desirable. Instead, it is important to identify *how small, small farms should be* to ensure food security. Answers to such a question would have important lessons for land reforms and distribution.

For rice cultivated during the dry season, the aggregate rice yield figure is the highest in Babaong (3.16 tonnes/hectare), followed by Prek Kmeng (2.69 tonnes/hectare). The lowest yield is in Khsach Chiros at 1.39 tonnes/hectare. (Appendix 3, Table 1, Production per Household) As stated earlier, Babaong's agriculture is relatively more modernised while Khsach Chiros is located in a more remote area. Prek Kmeng shows relatively high productivity because its dry season crop is more scientifically cultivated compared to other villages (Kim, Chan and Acharya 2002). Next, the proposition of small farmers possessing smaller quantities of rice — as found for the wet season rice — holds for this season as well.

Again, seen in the regional context, production per household (food availability) is not synchronous with the yield rate at the aggregated village level. The highest rice availability is seen in Andong Trach (wet season) and Babaong (dry season), though the yield rate in Andong Trach is lower than the average of nine villages. These data confirm that the yield rate does not guarantee plentiful food availability to the farmers. Instead, if farmers possess larger land plots there is more food within the household, as seen in Andong Trach.

To make a time based comparison, data from CDRI's 1997 survey shows that the average productivity in Prek Kmeng was 3.33 tonnes/hectare (3.43 in 2001); in Babaong it was 3.56 tonnes per hectare (3.16 in 2001); and in Trapeang Prey it was 1.86 tonnes per hectare (1.19 in 2001). In two of the three villages, the land productivity has fallen though in the third it has risen. It is not clear at this stage whether much should be read from these aggregated figures, since yield rates change from one season to another. However, it could be stated that there has been no radical change in agriculture in these villages.

4.3. The Cost Structure

The costs calculated here are the costs paid out, not the input costs of personal endowments. Households may have to hire in labour depending on the extent of labour available within the household. The extent to which a farm has to hire labour has an impact on how much they may have to pay out in cash or reciprocity. There is therefore no strict standardisation of the definition of cost other than material cost, since little information could be collected on factor cost. Comparisons across villages are nevertheless attempted under the belief that at the *aggregate* village level, there would be some normalisation of personal/family labour versus hired labour. However, some care still has to be exercised in the interpretation.

The cost structure of Cambodian rice farming (incurred costs per hectare), for the nine villages, combined farm sizes, are presented in Tables 4.3a and 4.3b. The Tables are presented separately for the wet and dry season crops.

Table 4.3a. Cost of Wet-season Rice Production in 2000-01 (per hectare)

	Andong Trach	Krasaing	Khsach Chiros	Kanhchor	Dang Kdar	Trapeang Prey	Kompong Thnaot
	(Thousand riels per ha)						
Chemical fertilisers	9.0	65.4	0.3	0.0	20.2	26.1	65.2
Pesticides	2.4	5.9	3.3	10.2	1.1	0.0	0.0
Water	3.8	2.8	1.3	7.8	0.0	8.3	0.0
Land preparation	20.7	68.8	11.6	3.7	6.8	10.4	33.2
Transplanting	5.5	29.9	1.3	107.8	25.4	13.2	18.2
Harvesting	13.9	24.4	13.2	70.2	13.5	4.3	13.4
Threshing	4.6	20.3	0.6	3.0	8.8	0.0	4.0
Maintenance of tools	1.2	0.0	0.5	3.8	4.7	0.1	0.1
Transportation	3.9	16.3	1.5	0.8	1.7	0.5	1.5
Rent of land	7.4	0.0	0.0	56.3	2.6	2.2	0.0
Rent for tools and animals	0.0	1.0	0.0	0.0	0.0	3.1	0.0
Other	0.3	5.0	0.1	0.0	0.0	0.2	13.7
Total	**72.8**	**239.7**	**33.7**	**263.7**	**84.6**	**68.4**	**149.4**
	(Percentage of total)						
Chemical fertilisers	12	27	1	0	24	38	44
Pesticides	3	2	10	4	1	0	0
Water	5	1	4	3	0	12	0
Land preparation	29	29	34	1	8	15	22
Transplanting	8	12	4	41	30	19	12
Harvesting	19	10	39	27	16	6	9
Threshing	6	8	2	1	10	0	3
Maintenance of tools	2	0	2	1	6	0	0
Transportation	5	7	4	0	2	1	1
Rent of land	10	0	0	21	3	3	0
Rent for tools and animals	0	0	0	0	0	5	0
Other	0	2	0	0	0	0	9
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Tables 4.3a and 4.3b show both absolute values of the costs and the relative share of each of the inputs in the total cost. Table 4.3a, which displays the cost structure for wet rice crop, shows costs per hectare to be rather high. They are around 250,000 riels in Krasaing — a relatively more modernised agriculture village — and Kanhchor, followed by Kompong Thnaot at 150,000 riels. The other four villages have total costs of less than 100,000 riels per hectare. The possible reason why a relatively remote fishing village like Kanhchor has high costs for wet-season rice production is because of high transplanting and harvesting costs (labour has to be hired). In places where the overall costs are low, reciprocal or personal/family labour is most likely extensively deployed, for which there is no explicit payout. (Sedara, Sophal and Acharya 2002)

In fact, a large component of costs relates to labour-related expenses. Other than fertilisers, pesticides and rents, all other items are labour-related. In villages and households where personal or family labour is not available due to migration or a simple shortage of able-bodied male workers, labour has to be hired, raising the costs. It is not surprising that numbers of female-headed households, who lack male labour, are unable to use lands effectively, and lose them (Kim, Chan and Acharya 2002)

Table 4.3b. Cost of Dry-season Rice in 2001

	Krasaing	Khsach Chiros	Prek Kmeng	Babaong	Kanhchor
	(Thousand riels per ha)				
Chemical fertilisers	186	15	12	82	57
Pesticides	20	8	5	19	4
Water	26	93	70	55	97
Land preparation	194	3	42	30	11
Transplanting	44	10	66	47	31
Harvesting	11	5	32	72	26
Threshing	25	0	24	26	5
Maintenance of tools	0	4	3	3	6
Transportation	11	0	22	17	0
Rent of land	24	0	1	13	4
Rent for tools and animals	9	1	0	0	0
Other	29	0	16	2	4
Total	**580**	**139**	**291**	**367**	**243**
	(Percentage of total)				
Chemical fertilisers	32	11	4	22	24
Pesticides	3	5	2	5	2
Water	5	67	24	15	40
Land preparation	33	2	14	8	4
Transplanting	8	7	23	13	13
Harvesting	2	4	11	20	11
Threshing	4	0	8	7	2
Maintenance of tools	0	3	1	1	2
Transportation	2	0	8	5	0
Rent of land	4	0	0	3	1
Rent for tools and animals	2	1	0	0	0
Other	5	0	5	1	2
Total	**100**	**100**	**100**	**100**	**100**

Farmers in Krasaing and Kompong Thnaot apply fertilisers in relatively high quantities as both villages are agriculturally better endowed and use more-modern agricultural techniques. In all other villages, material inputs are applied in small quantities, if they are applied at all. It is evident that wet season agriculture, largely relies on labour inputs alone.

The costs, in absolute quantities, are higher in dry season cultivation compared to wet season cultivation, as seen from Table 4.3b. Aggregated data shows that the average cost per hectare for dry season cultivation is about 80 percent higher compared to that for the wet season. Not only is there higher application of material input (fertiliser, pesticide and water), but labour input is also high, particularly in land preparation. Next, the overall application of these inputs is higher in the more modernised villages. The dry season crop is within the realm of more modernised agriculture, since only those farmers who possess adequate means of production cultivate the dry season crop.

In conclusion, the wet season crop can be characterised as subsistence-oriented, and primarily dependent on labour inputs. The returns are commensurately low. In contrast, more inputs are applied in the dry season crop, so even though costs rise, so do returns.

4.4. Profitability of Crops

If an agricultural economy is gradually integrating into the market system, as with Cambodia, profits and profitability are very meaningful propositions to the economy of a farmer. In this case, profit is defined as the amount left after cost deductions, meaning all material costs and hired labour costs. Although capital costs or land costs in these settings are difficult to evaluate through survey methods, profit can best be interpreted as the combined return on

land, capital and personal/family labour, (though some bias can also creep in because of an unequal application of hired labour).

Table 4.4 provides data on profitability for the wet season rice crop. This is defined as profit per household, profit per hectare, profit per tonne of rice, and profit per riel of production. The 'thousand riels/tonne' and the 'percent of total production' categories in Table 4.4 present a pristine form of profitability, namely, profit as a proportion of production.[28] The table shows that at the 'all villages' level, profitability (percent of total production) is quite large in farms of all sizes. It is the highest in the farm size group 0.5–1 hectare, followed by that of the smallest farm size. Only in the largest land size class is the profitability half that of the average profitability. The village specific picture is mixed (see Table 3, Appendix 3). Andong Trach and Khsach Chiros show an exact inverse relationship between farm-size and profitability, while in others the order is not so exact. Nevertheless, aggregated data indicates the tendency for the relatively smaller sizes of plots to yield higher profitability. When looking at thousand riels/tonne, Table 4.4 suggests a similar conclusion.

Although the general thesis that smaller farms — which yield more and are more profitable — is not being challenged, a caution must be raised. Smaller plot holders do not necessarily pay out for all the inputs: they provide much input from their own resources, principally labour; and these inputs are not counted as costs paid out. This could partly be a reason for the smaller farms appearing to be more profitable.

Table 4.4. Profitability of Wet Season Rice Production by Farm Size (all villages)

Farm Size	Sample size	Thousand riels/ household	Thousand riels/ha	Thousand riels/tonne	Percent of total production
>0 – 0.5ha	225	129	395	214	68
>0.5 – 1ha	133	264	322	231	71
>1 – 2ha	73	341	209	177	58
>2ha	64	371	101	95	31
Total	**495**	**227**	**309**	**197**	**63**

Profitability is actually the net income per hectare. If the economies of scale are neutral, then profitability per hectare and profitability per unit of output should correspond perfectly. Since this cannot be ascertained, data on profitability per hectare is presented separately (Thousand riels/ha). For the aggregate of nine villages, there is an exact inverse order. However, the thousand riels/household category shows that incomes derived from farming, of households who own smaller plots, is distinctly lower than incomes derived from farming larger plots. This order is exact at the all-villages level. The earlier conclusion, that under rain-fed conditions smaller farms are technically more efficient, is echoed here in the form of them yielding higher *per hectare* incomes. However, as outlined in Chapter 3, households owning smaller plots possess less food and earn lower *disposable* incomes.

The four profitability ratios for the dry season rice crop, by farm size groups, are presented in Table 4.5. Data seen from this table suggest a considerable drift from the classical 'farm size-productivity' and 'farm size-profitability' relationships seen earlier. For the all-village aggregate, the profitability percentage (percent of total production) is the highest for the *largest sized* farms. The 0.5–1 hectare group and then the 1–2 hectare group follow this. Although the profitability ratios are not very different from one size group to another, profitability in the smallest group of farms, *i.e.* less than 0.5 hectare, is distinctly low: about half as much as that in the other size groups. The pattern is similar for profitability per tonne

[28] This measure is so referred because it reflects the technical capacity of an enterprise or farm to provide returns from production.

of rice (Thousand riels/tonne), though some slight difference in the order has crept in because output prices are not uniform across farms and villages.[29]

Profitability per hectare (*i.e.* income per hectare) is also higher in the larger farms than in the smaller ones at the aggregated all-village level. The order of positive association between profitability with farm size is not exact anywhere, but the *general* pattern holds in three out of the five villages where farmers sow the dry season crop (Appendix 3, Table 2).

The analysis in this section, therefore, negates the superiority of smaller farms during dry-season crop cultivation. Next, data illustrating the thousand riels/household in Table 4.5 substantiates the earlier finding, that households owning larger farms earn more in terms of the absolute value of income, in the dry season as well.

All these data support the view that, while under low-input farming conditions, small farms may be more productive and yield higher incomes per hectare; they yield lower incomes to farmers. This is because gains from higher land yields are not commensurate with losses in total incomes due to small sizes of plots. At the same time, smaller plots permit little use of modern methods of farming. Next, as low input farming gives way to more intensive use of fertilisers, controlled irrigation and modern variety seeds, even the advantage of the small farm is lost.[30] Land fragmentation is, therefore, harmful to the incomes and food security of farmers. Lastly, these data, when seen in the context of the analysis conducted in the previous chapter, reinforce the statement that the *size* of the land holding matters.

Table 4.5. Profitability of Dry Season Rice Production by Farm Size (all villages)

Farm size	Sample size	Thousand riels/ household	Thousand riels/ha	Thousand riels/tonne	Percent of total production
>0 – 0.5ha	95	107	179	93	29
>0.5 – 1ha	70	325	393	147	51
>1 – 2ha	68	589	362	134	49
>2ha	44	1,355	393	141	52
Total	**277**	**469**	**305**	**122**	**43**

4.5. Productivity and Profitability Association

Should high crop yield rate be accompanied by high profitability, implying more incomes to farmers? Under usual circumstances, this relationship should be strong and positive, unless market prices drastically change against primary products, or farms operate in zones where there are high diseconomies. Regression equations were estimated to examine some of these propositions.

In the first equation, the dependent variable is the profit per household (in riels) and the independent variable is the yield per hectare (in tonnes). An estimated equation of this type (with variables transformed to their logarithmic form) would yield the elasticity of farmers' incomes with unit increase in land yield rates. The ordinary least squares regression equations, estimated separately for the wet and dry seasons, using pooled data from all the villages, are as follows:

Wet season

(1) Ln (Profit/household) = 5.058 + 0.440 Ln (yield/hectare); $R^2 = 0.110$; n=456
(7.010)

[29] Two obvious reasons why prices are different: one, different farmers sell their crops at different times; and two, there are regional variations.

[30] Data on costs were collected in the 1997 survey as well. Their tabulation, however, is incomparably different from that which can be calculated from the present data. Therefore, no comparisons have been made.

Dry season

(2) Ln (Profit/household) = 5.576 + 0.883 Ln (yield/hectare); R^2 = 0.264; n=276
(9.941)

(Brackets show t values and Ln to natural logarithm; the coefficients are significant at 99 percent confidence)[31]

These equations show that a 10 percent increase in land yield (profit/household) would increase by only about 4.4 percent for wet season cultivation, and about 8.8 percent for dry season cultivation. Increase in productivity, particularly in the wet season crop, would thereby increase the farmers' household income much less than in proportion to the yield rate. Yields per hectare are generally higher in smaller plots, particularly in the wet season, but household incomes grow in a much smaller proportion.

Regression equations that would explain the relationship between profitability per hectare and the yield rate, for the wet and dry seasons, for the pooled sample, are as follows:

Wet season

(3) Ln (Profit/hectare) = 5.372 + 1.024 Ln (yield/hectare); R^2 = 0.561; n=456
(24.114)

Dry season

(4) Ln (Profit/hectare) = 5.034 + 0.990 Ln (yield/hectare); R^2 = 0.392; n=246
(12.561)

(Brackets show t values and Ln to natural logarithm; the coefficients are significant at 99 percent confidence)

These equations show that the elasticity of profit (net income) per hectare in both seasons is near unity. In other words, incomes per hectare rise in the same proportion as the yield rates in both the seasons. This implies that production and the quantity of profits move in near total synchronisation. The fact that incomes per hectare and incomes per household are not synchronised suggests that change in yield rates is associated with some reorganisation of land ownership — notably land fragmentation.[32] This statistic supports the earlier finding that while small plots of land are more productive; they do not necessarily yield better incomes to the households.

Lastly, the equations to estimate the relationship between profit per tonne of production and the land productivity are expected to indicate results on, whether or not the unit cost decreases as yield rate increases. The estimated equations are as follows:

Wet season

(5) Ln (Profit/tonne) = 5.367 + 0.056 Ln (yield/ha); R^2 = 0.004; n=456
(1.419)

Dry season

(6) Ln (Profit/tonne) = 4.886 + 1.104 Ln (yield/ha); R^2 =0.234; n=246
(8.654)

(Brackets show t values and Ln to natural logarithm; the coefficient in equation (5) is statistically not significant)

[31] t values are statistics that determine the extent of significance of a coefficient and R^2 depicts the overall explanation in an equation. n = the number of observations.

[32] Field inquiries suggest that better quality land is fragmented faster, as stated previously in this Chapter. Such a fragmentation denies the distribution of gains from productivity to reach the farmers.

The first equation, which is not a good fit statistically, suggests no reduction in unit cost (inverse of unit profit) with rise in yield rate. The second equation, being a good fit, does suggest the existence of such a relationship for the dry season. In other words, if the dry crop yield increases, the unit cost would decrease, thereby raising competitiveness of the crop.

4.6. Summary

This chapter examines the relationships between farm size, productivity, profitability, and the cost of production in agriculture.

Smaller farm sizes are generally, though not exclusively, more productive in terms of yield rates. The inverse, farm size-productivity relationship, holds in the case of rice cultivation in the wet season rice cultivation. For the dry season crop, this relationship is not so evident. Since wet rice cultivation requires little other than labour, and labour is abundant in many of the villages, there is a higher application of human resources producing higher yields. In contrast, dry season agriculture requires careful nurturing, with application of multiple inputs, and small plot holders are not necessarily in possession of, or capable of applying, these inputs. With these factors taken into account, the relationship of higher productivity with smaller sized land plots weakens.

Small farms offer better incomes per hectare, particularly in the wet season, but do not yield higher incomes to the households. In the dry season, even this relationship weakens. Therefore, while land productivity and profit per hectare are closely synchronised, the elasticity of household income with land yield rate is less than unity. Land fragmentation is the reason for lower profit and better quality lands are fragmented faster.

The overall cost structure suggests that the material intensity of cultivation is low. In areas where farmers apply fertilisers and other inputs, they get better yields.

With respect to the nature of land distribution and the productivity of Cambodian agriculture, data analysis suggests that the current small size of individual plots (a legacy of the past when agriculture was largely subsistence type and farmers only had the means to cultivate small plots) has now become necessary because of increased population pressure. Land atomisation, finally culminating in landlessness, makes individual farmers food insecure and they are forced to look for options outside agriculture for a livelihood.

Chapter Five

Indebtedness and Credit Needs

Rural households in Cambodia, as with other agrarian economies, need credit, which is often required seasonally or otherwise round the year. Farmers contract loans, which they usually pay back at the time of harvest, either partially or fully. Money is borrowed again at times of need, and the cycle goes on. Money is not necessarily borrowed for meeting the needs of cultivation, trade or similar purposes; it could also be borrowed for consumption, festivals and rituals. Farmers do not really distinguish between a loan raised for one purpose or another. They contract a loan; use the money according to need, and pay it back whenever and wherever there is a surplus.[33]

At the same time, it has been found that credit is expensive. The interest rate is high because the risk of default is high — crops can fail and historically there has been no legal system for arbitration.[34] Further, since institutional sources of credit are few (if any) and credit markets are spatially fragmented, there is a *de facto*, localised monopoly (of two or three moneylenders) keeping credit supply limited and the cost of credit high.

Additionally institutional sources do not recognise the credit need cycles of farmers. They give out loans for meeting specific (only productive) purposes, against collateral, and the loans are to be returned in a predetermined time. Each of these contravenes a farmer's requirements in an agrarian set up. This is another reason why private moneylenders assume such a central position.

As stated above, credit forms an important element in the livelihood cycle of farmers. Yet, it is crippling to many since not all possess the capacity to pay back the loans at the prevalent interest rates. It is not surprising that being in debt forms an integral part of a farmer's life cycle. An ordinary Cambodian farmer is perennially in debt.

In this chapter, an attempt is made to answer some of the following questions using the survey data.

1) To what extent are villagers indebted?
2) What are the sources of credit?
3) What is the cost of credit?
4) Who among the villagers bears the maximum burden of debt?

[33] This is a typical economy that Chayanov modelled almost a century back, for Russia. See Chayanov (1986).

[34] Most historical records find that interest rates have traditionally been very high in Cambodia. See Tarling (1999).

5.1. Households Contracting Loans

Table 5.1 provides data on the proportion of households who had credit outstanding, at the time of the survey, over the two rounds of data collection (exact cash amounts are illustrated in Appendix 4, Table 1). Table 5.1 indicates that up to 53 percent of villagers in the dry season survey and 62 percent in the wet season had contracted some kind of loan. Of the 53 percent in the dry season survey, 50 percent of households had contracted cash loans and 13 percent in kind. This means that 10 percent of households contracted mixed loans (both cash and kind). Similarly, of the 62 percent in the wet season, 52 percent contracted loans in cash and 28 percent in kind implying that 18 percent of households contracted mixed loans involving cash as well as kind.

Table 5.1. Percentage of Households with Outstanding Credit

	Dry Season			Wet Season		
	In cash/ kind	In cash	In kind	In cash/ kind	In cash	In kind
Tonle Sap Plain						
Andong Trach	39	35	13	41	33	18
Krasaing	40	35	9	53	53	10
Khsach Chiros	67	67	28	75	61	43
Mekong Plain						
Prek Kmeng	66	66	8	70	66	16
Babaong	61	50	31	45	39	11
Plateau						
Kanhchor	56	55	10	58	42	28
Dang Kdar	51	47	15	58	47	25
Trapeang Prey	49	46	4	82	65	56
Coastal						
Kompong Thnaot	48	48	2	79	61	48
All Villages	**53**	**50**	**13**	**62**	**52**	**28**

Seen village wise in the first season, the more modernised and market-exposed villages have a larger number of households who have loans outstanding, and vice versa. For example, more than 60 percent of households in Babaong and Prek Kmeng had loans outstanding against them, while this percentage was 51 in Dang Kdar and 56 in Kanhchor (the dry season survey data). There are of course exceptions, Khsach Chiros for example, and it is difficult to explain, *a priori,* why so many in that village have contracted loans. Krasaing probably has fewer households having outstanding loans because there is large landlessness there. Workers migrate out to work: they do not have to borrow to cultivate land or meet other local expenditure.[35] There is also some difference between the rounds. There are more loans contracted during the wet season, *i.e.* the period April–September, a period when there is greater shortage and there is demand for cash to meet the input costs of the wet rice crop. However, the village-specific pattern is different in the wet season survey: people in Babaong borrow much less while those in Kompong Thnaot much more.

The average time for which money is borrowed is not very long; it is less than six months. This strengthens the suggestion of a 'harvest to harvest' cycle of loan payback, mentioned earlier.

Compared to the earlier survey of 1996–97, the extent of participation in the credit market has reduced: it is lower by some 10-20 percent. The 1996–97 survey reported that in Prek Kmeng, 76 percent of households had loans outstanding against them, in Babaong, 63 percent, and in Trapeang Prey, 92 percent.

[35] Alhough some borrow to travel outside the village.

5.2. Loan Amounts and Interest Rates

The average number of loans contracted was 1,385, by the 1,005 households surveyed, suggesting that on average, each household has more than one loan.[36] On aggregate, the largest single source of credit is 'relatives and friends' (44.5 percent); a finding also supported by data from the SES conducted in 1997 and 1999. (Exact figures on the source of loans the number of loans contracted, the average loan size, and the interest rate are given in Appendix 4, Table 1). The next largest supply is from moneylenders (33.1 percent), then institutional sources (15.7 percent), and finally, others. Across villages, there is no discernible pattern. It is seen nevertheless, that villages where activities are more commercialised are prone to borrowing. This is expected because of their larger market integration.[37] CDRI's 1996–97 survey found that in Prek Kmeng, about 40 percent of households obtained credit from relatives, in Babaong 66 percent, and in Trapeang Prey, 26 percent. Compared to that period, the importance of relatives as a source of credit has now reduced. The role of the moneylender in extending credit in the three resurveyed villages has also undergone a change. In Prek Kmeng it has risen from 43 percent to 75 percent, in Babaong it has fallen from 34 to 23 percent, and in Trapeang Prey it has reduced from 25 to 9 percent. It is difficult to make any firm judgement from these data, other than that changes are taking place, with institutional sources now making some presence.

The average size of a loan is about 315,000 riels — 277,000 in the dry season survey and 354,000 for the wet season survey. A larger average size of loan is to be expected in the wet season; it being a lean season and one in which farmers borrow to sow the wet season crop. Next, though institutional sources of credit are not yet dominant, the average size of a loan is the largest from ACELEDA (685,000 riels). Moneylenders come next, and the size of a loan from relatives comes third. The average loan from a relative is only about a third of the size of an average loan obtained from ACELEDA. Although relatives and friends provide a larger *number* of loans, the size of each loan is smaller — perhaps these loans are only meant to tide over seasonal food shortages or other contingencies. In contrast, loans from institutional sources are larger because most of them are meant for productive purposes. Since a large portion of the demand is meant for tiding over seasonal shortages, it is not surprising that both demand and supply of credit from institutional sources are limited.[38]

Variations across villages show larger loans in Prek Kmeng and Babaong compared to most other villages. In Prek Kmeng, people borrow extensively for fish culture, while in Babaong it is for modern seeds, fertilisers and other material inputs. Andong Trach is an outlier: the average loan size in this village is larger than the average despite it not being such a market-exposed village. It is a possibility that the resettler families borrow large amounts for resettlement. In the other villages, since agriculture is not modernised and non-farm activities are not so vibrant, the quantity of loans needed and extended is accordingly small.

There is a big difference in the interest rates charged by the different sources of finance. On average, moneylenders charge the highest, in the range of 6–9 percent each month (70–100 percent annually, though the lending period is much shorter), while loans from relatives could be fairly inexpensive. Institutional sources, typically ACELEDA, charge 3–5 percent each month, which translates to about 36–60 percent a year. This is low compared to the moneylender's rate, though still high in absolute terms when seen in the context of the rate of return on capital (Kang 2002). Despite the high interest rate charged by moneylenders, people go to them because there are supply constraints from institutional sources. In addition, as

[36] This statistic is not to be compared with Table 5.1 which answers the question, whether a household was indebted or not, at the time of the interview.

[37] It is difficult to discern why there are more loans taken per household in the dry season survey rather than the wet season survey. Table 5.1 shows that the numbers of outstanding loans per household are higher in Round 2 (the wet season).

[38] Kim, Chan and Acharya (2002).

stated in the introduction to this chapter, the demand for credit is part of the agrarian way of life in rural areas, but institutional sources only lend monies for specific purposes and in predetermined quantities. This mismatch is an important reason for villagers to go to moneylenders.

5.3. Incomes and Interest Rates

Is there a higher risk for the lenders if they lend to the poor rather than to the non-poor? In other words, are the poor required to pay more in the form of interest rates to cover this risk compared to the non-poor? Table 5.2 presents data on interest rates paid according to income deciles.

Table 5.2. Interest Rate and Amount of Loan Obtained over the Wet and Dry Seasons

	Dry Season Survey				Wet Season Survey			
Decile by income per adult unit	**Monthly interest (%)**	**Loan in cash**	**Loan in kind**	**Total**	**Monthly interest (%)**	**Loan in cash**	**Loan in kind**	**Total loan obtained**
	(Thousand riels/household)				(Thousand riels/household)			
1 (10% Poorest)	2.1	141	16	157	2.6	87	16	123
2	2.5	129	11	141	2.6	109	15	124
3	2.8	168	14	182	3.7	111	30	141
4	3.3	131	11	142	2.8	119	20	138
5	3.5	169	14	183	2.9	226	19	245
6	4.4	142	21	163	4.6	131	26	158
7	4.2	157	13	170	4.3	169	10	178
8	4.8	191	6	196	4.3	409	18	427
9	5.1	304	10	314	3.5	216	8	224
10 (10% Richest)	3.6	284	28	312	3.2	599	10	609

Table 5.2 provides no evidence for the hypothesis that the poor pay more, in either of the rounds. On the contrary, non-poor households pay a higher interest rate, though the interest rate and income size-group do not follow the same order. What could be the reason for this? The non-poor borrow larger quantities but this should not be the reason for a higher interest rate. One reason could be the portfolio: that the poor borrow more from relatives and friends who charge less interest, while the non-poor borrow from others who charge more. Part of the reason could also be with problems associated in the assessment of incomes in agrarian settings.

To follow up this question further, interest rates paid by the borrowers were calculated according to the borrowers' size of landholdings. Data suggests that there is a weak, albeit distinct, inverse relationship between the land size holding of a household and the interest rate it pays. In the Mekong plain, for example, interest rates for the landless were 5.5 percent a month, but only 3.8 percent a month for those who own more than 3 hectares of land (see Appendix 4, Table 2). In other words, those households who possess larger land plots, at least in some cases, pay a smaller interest rate. It appears as if the land controlled by a household is the protection (in many cases collateral) against default. In short, unprotected loans cost more.

5.4. Loans and Repayment Capacity

People borrow dependent to their need, but capacity to pay back depends on income. The quantity borrowed in relation to incomes therefore assumes importance. The ratios of loans to incomes are calculated in Tables 5.3a and 5.3b. Table 5.3a provides data on the loans per adult unit[39] by different income deciles, and Table 5.3b classifies data by the sample villages.

[39] Adult units are also equated as two children for one adult, as children can be an important source of income.

Table 5.3a. Loan as a Proportion of Income (by income classes)

Decile by income per adult unit	Loan quantity as a percentage of total income	Loan per adult unit (Thousand riels/head)
1 (10% Poorest)	40	54
2	27	57
3	29	79
4	19	65
5	23	93
6	14	68
7	13	74
8	19	133
9	14	128
10 (10% Richest)	13	227

Table 5.3b. Loan as a Proportion of Income (by village)

	Loan Quantity as a Percentage of Total Income	Loan per Adult unit (thousand riels/head)
Tonle Sap Plain		
Andong Trach	13	57
Krasaing	13	64
Khsach Chiros	31	91
Mekong Plain		
Prek Kmeng	30	243
Babaong	24	148
Plateau		
Kanhchor	21	77
Dang Kdar	22	48
Trapeang Prey	21	51
Coastal		
Kompong Thnaot	13	69

Table 5.3a shows that, despite an increasing size of loan, the extent of debt per person decreases, as (annual) incomes rise. The ratio of loan to income was 40 percent in the lowest income decile though it was only 13 percent in the top decile. At the same time, the average size of debt per person was 54,000 riels in the lowest decile households, though it was 227,000 riels in the top decile. It may not be possible to comment on the optimal size of borrowing per person, but these data suggest that the poor are relatively more indebted compared to the non-poor. Overall, though, everyone is indebted.

Table 5.3b suggests that there is a relatively high loan to (annual) income ratio in Khsach Chiros and Prek Kmeng (in the range of 30 percent), followed by Babaong, Trapeang Prey, Dang Kdar and Kanhchor (21–24 percent), and the rest at 13 percent. The more modernised villages, Prek Kmeng and Babaong, have more debt outstanding. The rest of the pattern is indiscernible; perhaps a number of factors like demography, asset distribution, and access to natural resources come into play. One of the reasons for not being able to comment on this is because little is known about the use of credit.

5.5. Summary

Borrowing money is an integral part of an agrarian way of life. People borrow for both productive purposes as well as for consumption without really making a distinction between the two. Because of this, most loans are raised from non-institutional sources, typically moneylenders, and relatives/friends. Risks of default are perceived by lenders to be high, and at the same time, the supply is limited. Consequently, the interest rates are high. There appears to be an inverse association between the size of land holdings of the borrowers and

the interest rate paid by them. This might be a weak association, but it implies that possession of larger plots of land is a hedge against default. The proportion of debt outstanding per person is high among the poor compared to the non-poor, though the absolute amounts borrowed by the poor are far smaller than those borrowed by the non-poor. Most farmers and villagers are nevertheless indebted.

Chapter Six

Diversification of Rural Livelihoods, Common Property Resources and Total Income

Diversification of livelihood pursuits is crucially important and a part of life in rural areas in many developing countries. It not only provides earnings to supplement the usually inadequate main source of income but also reduces the risks arising from relying on single employment (Ellis 2000). Rural people in Cambodia have traditionally earned livelihood from multiple sources: agriculture, fisheries, and forest produce, to name the most important ones. With the advent of modernisation over the last several decades, multiple bodies (including those from outside the agrarian system) have begun to make claims on natural resources. This has disturbed the earlier harmony that existed between income flows from different sources to the farmers. Since farm sizes have been small all along, a reduction of income from non-farm sources implies that farm incomes by themselves would not meet food security requirements, and incomes from multiple sources become inevitable for sustaining livelihood. Villagers have begun to further diversify their income generation away from conventional agricultural sources, to others like wage labour and trade. It is in this context that this chapter attempts to identify the different income sources, and to quantify incomes from them.

The specific questions considered by this chapter are:

1) What is the absolute income derived from different sources?
2) To what extent do rural households depend on common property resources?
3) What is the extent of differential dependence of the poor and the rich on common property resources?
4) Has the availability of income from the commons changed in the recent past?

6.1. Household Income by Source

Besides cropping and raising animals, villagers depend on (i) petty trading and food processing, (ii) hiring out labour for both farm and non-farm work inside and/or outside the village, (iii) fishing and foraging, and (iv) seeking incomes from other means, such as renting out assets.

Income is among the more difficult variables to calculate from household surveys; therefore, most researches use expenditure as a proxy. However, expenditure data cannot be used for analysis or comparison of incomes from different sources. Efforts were therefore made to generate data on incomes in this survey. In each round, interviewees were asked to recall their incomes from all possible sources during the past six months since a clearly identified reference point. *Phjum Ben* in October 2000 was used for the first round and the Khmer New Year in 2001 for the second. Total income for a full year period (October 2000 to

September 2001) was thereby calculated over a six-month period. Income from each source is defined as follows:

1) Income from 'household farming' is the gross value of production of rice and other crops. Income from agriculture includes gross income from selling livestock raised by the households as well.
2) Income from 'self-employment in non-agricultural activities' refers to the net income from trade or business operated by the households.
3) An income from hiring out labour comes from wages earned by household members who work for others, either inside or outside the village. Income from migratory work is included in this category.
4) Income from CPR refers to 'cash' income earned by the households by selling products they collect from flooded rice fields, permanent water bodies, forests, etc. Income from CPR excludes products that are collected for personal consumption. Therefore, income from CPR underestimates the total benefits from CPR.[40]
5) Income from other sources includes interest from lending money, cash income from renting out assets such as land, machinery, animals, farm tools and transport, and money transfers.

Figure 6.1. Household Income by Source (thousand riels per year)

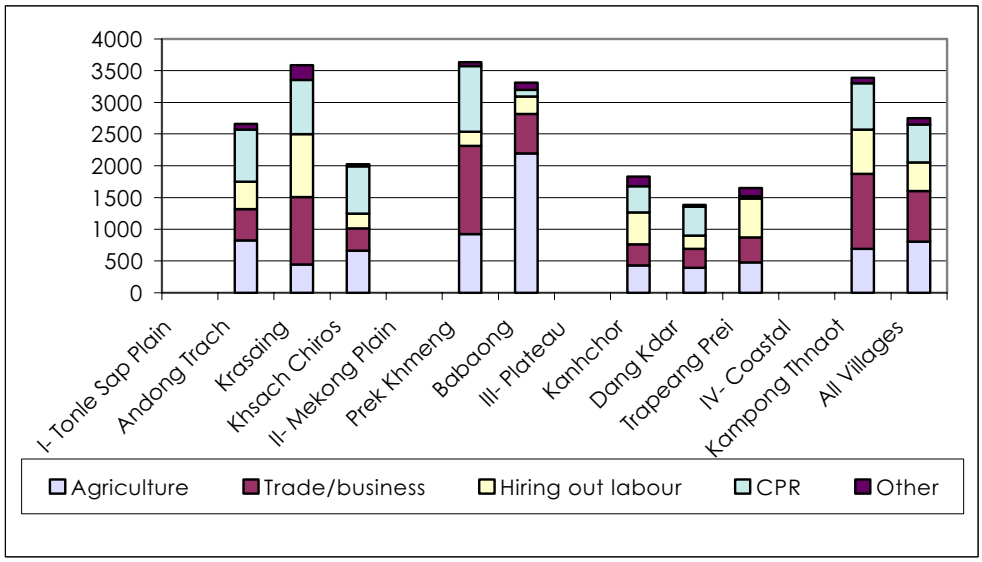


Figure 6.1 presents data on the total income and income from each broad source (full figures in riel and percentages are presented in Appendix 5, Table 1). The average annual income per household in the nine villages was 2.75 million riels (or about $700) a year for 2000–01, which works out to an income per capita of around $140 a year. This is lower than the national average of $260. Prek Kmeng was the most affluent village (income: 3.63 million riels, or $930 per household, or $180 per capita), followed by Krasaing, Kompong Thnaot and Babaong. The poorest villages were the ones in the Plateau region where the total household income was less than $500 a year (or $100 per capita).

[40] Personally-consumed CPR items are excluded to increase reliability for the recall of income from this source. It would be difficult for villagers to remember their exact food consumption over the last six months.

On average, agriculture accounted for only 29 percent of the total income, equivalent to the contribution from self-employment in small trade and business. The significance of agriculture varies across agro-climatic zones. Babaong, an agriculturally rich village, is a distinctive outlier in terms of income from agriculture. In this village, a household generated an average income exceeding 2 million riels a year from agriculture, more than twice that compared to any other village in the sample, in 2000–01. Income from agriculture, mainly rice cultivation, accounted for two-thirds of the total household income in that year. In the three villages in the Plateau region, where agricultural land is severely limited, income from agriculture did not constitute more than a third of the total household income. The most important revelation from these data is that, unlike what is commonly believed, agriculture is not the dominant source of livelihood (in these villages at least). Although one may concede that part of the trade and wage-income, have direct links to agriculture, this does not deny the fact that agriculture is *one of* the sources, and not the *only source of* income.

Households in Krasaing, Prek Kmeng, and Kompong Thnaot recorded high income from other small business and trade. The poorer villages have less income from this category; for instance, Dang Kdar, which has the lowest income ($354/household/year), also has the lowest share of income from this source.

Hiring out labour, which includes migrating for work outside the village, constitutes about 17 percent of total household income. Krasaing registered the highest contribution from migratory work: a large number of workers (at least one member from up to half the households) migrate to work in Thailand. On average, a household in Krasaing earned about 1 million riels from hiring out labour (28 percent), twice as much income as from agriculture during 2000–01. Next to Krasaing is Trapeang Prey, where an average household earned an annual income of 630,000 riels from hiring out labour. This source accounted for 37 percent of the total income over 2000–01. It could be suggested that one of the reasons the village with the lowest income (Dang Kdar) is poor is partly because there is a more limited opportunity for hiring out labour.

An average household derives 22 percent of its total income from CPR (Appendix 5, Table 1). Better off villages derive more income from CPR than villages that are not so well off (Babaong being the exception). In all the villages in the Tonle Sap region, income from CPR equals or exceeds that from agriculture. This is particularly true in Prek Kmeng, where income from fisheries is the main source of income. People in Kanhchor and Dang Kdar have traditionally depended on access to forest resources. Recently however, access to forests and tree felling has been severely restricted and villagers are facing difficulties.

Overall, the extent of dependence on forests seems to be lower than that on fishing, including fisheries in the Coastal region.

6.2. Changes in the Source of Income in the Three Resurveyed Villages

Data on three villages, Babaong, Prek Kmeng and Trapeang Prey, generated in the 1996–97 and 2001 surveys are presented in Figures 6.2 a–c. Incomes in 2001 are adjusted to 1996–97 prices to permit comparability.

Figure 6.2a. Change in Household Income by Different Sources in Babaong Village, Prey Veng (thousand riels per year)

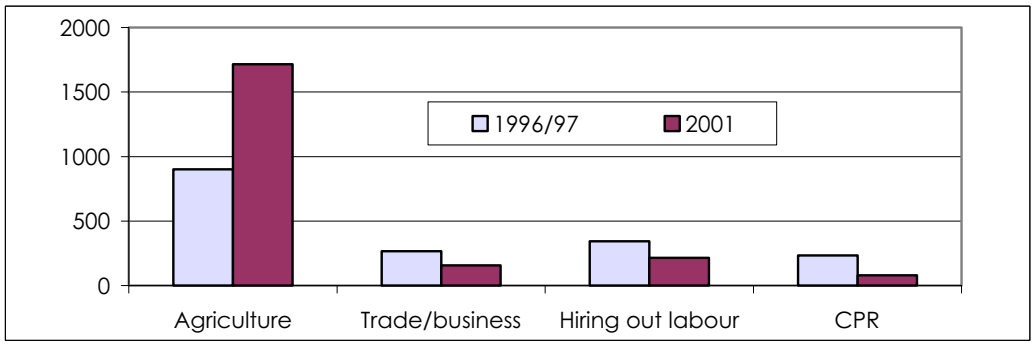


Figure 6.2b. Change in Household Income by Different Sources in Prek Kmeng village, Kandal (thousand riels per year)

Figure 6.2c. Change in Household Income by Different Sources in Trapeang Prey village, Kampong Speu (thousand riels per year)

In terms of total income, Babaong and Prek Kmeng achieved a substantial increase between 1996 and 2001, while Trapeang Prey experienced a slight drop. On average, a household in Babaong enjoyed a 43 percent increase in total income over the five-year period (or about 8 percent annually). A rather high rise of 82 percent was observed in Prek Kmeng, due mainly to increase in income from fishing. By contrast, Trapeang Prey experienced no growth in income over the five-year period. What explains these trends? The reason is that in all resource-based (as against skill-based) economies, physical resources generate the main incomes. In villages where the resource base has strengthened (agriculture in Babaong and fishing in Prek Kmeng) incomes have increased. In Trapeang Prey, the resource base has declined and dependence on labour has risen which has resulted in a fall in total income.

Incomes from agriculture in all three villages increased sharply between 1996 and 2001. Babaong almost doubled income from agriculture, from 901,000 riels per household to 1.71

million riels per household. Intensification of rice production on alluvial soils, with extensive application of modern variety seeds along with fertilisers and controlled irrigation, has primarily been the reason for this steep increase in income. Incomes from all other sources declined. The share of income from agriculture in this village climbed from 52 percent in 1996–97 to 69 percent in 2001 in real terms, while incomes from non-farm self-employment, wage labour and CPR fell sharply.

In Prek Kmeng, villagers derived a much higher income from agriculture and CPR in 2001 compared to that in 1996–97. In this village, agriculture includes reed, which was in high demand in 2001. The largest source of income is from fishing (CPR). The sharp rise in income from fisheries was possible due to the release of more than 50 percent of the fishing lots surrounding the village. It may be recalled that the government freed 56 percent of the fishing area under fishing concessions in the country during 2000–01. Additionally, fisheries have received a boost here since markets are close by; the village is only 25 km from Phnom Penh.

The backward village of Trapeang Prey experienced changes over the past five years as well. Income from agriculture rose by about 200,000 riels per household, from 205,000 riels per household to about 408,000 per household; pushing its share from 16 percent to 32 percent of the total income, between 1996 and 2001. What explains this increase? The main reason is that farmers in this village have begun to grow more non-paddy crops; these crops require less water (which is scarce here) and there is a market nearby. In contrast, income from non-farm self-employment fell by 254,000 riels, reducing its share from 45 percent to 26 percent in this five-year period. The absolute decline in non-farm incomes is a result of a sharp drop in the palm sugar production business. Many households have now given up their long tradition of palm sugar production because of the non-availability and increase in the cost of fuel wood. Another steep drop is seen in the income derived from CPR. Other resources in the village, such as frogs and small fish from rice fields, which were relatively plentiful in 1996–97, have also considerably reduced. Since the increase in agricultural income is not enough to feed all, Trapeang Prey villagers have relied increasingly on migrating out for work. This source provided the largest income (40 percent) in 2001. Members from almost all households migrate for seasonal agricultural work (mainly transplanting and harvesting rice) and other unskilled work to other villagers. However, since wages for unskilled work are low (often less than 3,500 riel a day), more reliance on wage labour also implies less income earned despite the additional effort required.

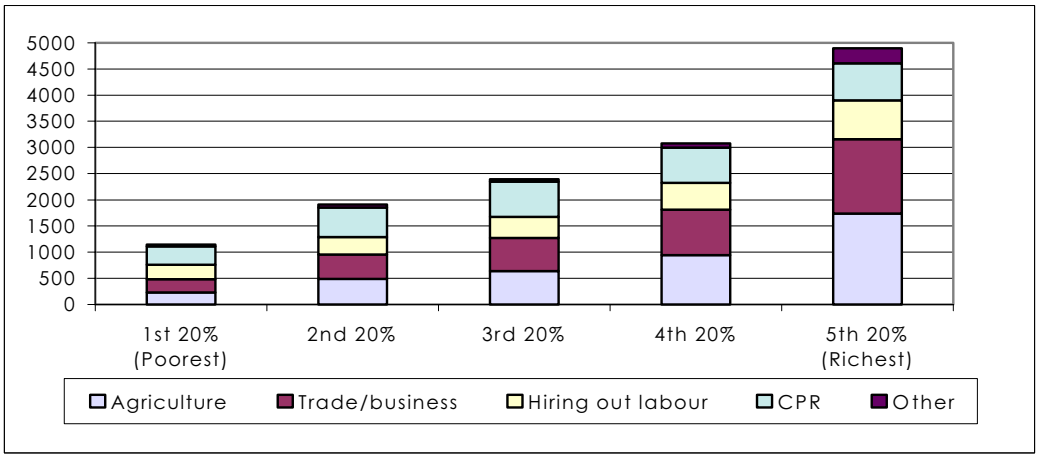
In short, this survey finds that the better-resource endowed villages have improved livelihoods while the backward village has become even more backward. The reason is that in villages where incomes are derived mainly from physical resources (Babaong and Prek Kmeng), one or more of the resources has been made to grow through improved management. One of the major reasons why resources grow relates to an exposure of farmers to larger market opportunities. In the Mekong Plain, out-migration as well as outreach by the government and NGOs has contributed to modernisation and resource growth. In the resource deficit village, more people have taken up unskilled labour, but since the returns from labour are less than those from physical resources, the total income in Trapeang Prey has fallen.

6.3. Sources of Income by Income-Classes

As seen previously, both the poor and the better off generally earn incomes from different sources. The poor are often landless and are thereby dependent on hiring out labour, whereas the better off possess a stronger asset base, including land, and they generate larger incomes from land and/or their own business. But what is the pattern of incomes derived from CPR? This survey finds that the poor depend relatively more on CPR than the better off. At the same time, the better off *possess* more means to exploit CPR.

Figure 6.3 presents the significance of each source of income, by income quintiles for the pooled sample from the nine villages. In general, the poorer the households are, the less income they generate in terms of absolute value, regardless of the source. The average income of a household in the richest 20 percent of households was 4.89 million riels (or $1,255) a year, while that in the poorest 20 percent was only 1.14 million (or $293), in 2000–01. Agriculture contributed 20 percent to the total income of the poorest and 35 percent to the richest. For the poorer 60 percent in the population, CPR (30 percent share in income) provided more income than agriculture (20 percent share). In absolute terms, though, the more affluent earn more than the poor *from every source*, including CPR.

Figure 6.3. Sources of Household Income by Quintile of Income Groups (thousand riels per year)



The relative importance of each source of income varies according to the agro-climatic conditions as well. The relative significance of source of income, by quintile, in each village in the four eco-systems was investigated. (Village-by-village percentages are included in Appendix 5, Table 3).

In Andong Trach, the poorest 20 percent depend heavily on CPR and hiring out labour. Agricultural income accounted for only 7 percent of the total income since most of the poor are landless. The richest 20 percent earn 36 percent of their total income from agriculture, while they derive 24 percent from CPR and 18 percent from labour. In Krasaing, another village of the Tonle Sap Plain, the pattern of sources of income is quite different. While the poorest are often the landless and therefore earn little income from agriculture, they generated about half their income from hiring out labour, mainly to Thailand. The better off earn incomes from diversified sources: the share of CPR in their income did not exceed 16 percent in 2001. Khsach Chiros, also located in the Tonle Sap Plain, has more land than the other villages. The poorest here could earn more income from land (22 percent) compared to the two other villages in the region. However, even here, CPR provides twice the income that agriculture does.

The two villages in the Mekong Plain exhibit contrasting income patterns, reflecting their different resource endowments. In Prek Kmeng, the poorest greatly depend upon CPR (49 percent of total income) and income from agriculture constitutes only 15 percent of their total income. Even for the top 20 percent of income earners, income from agriculture constitutes only about a third of total income. In contrast, income from agriculture in Babaong constitutes about 50 percent of the total income for the poorest 20 percent and 70 percent for the richest 20 percent. CPR constitutes a small proportion of the total income.

In the three villages on the Plateau, the pattern of sources of income is not very different between income groups. In Kanhchor and Trapeang Prey, the poor as well as the

better off derive about the same proportions of income from agriculture, petty trade, wage labour and CPR. In Trapeang Prey, where almost all the households are uniformly poor, income from CPR constitutes only a small share of total income in all groups across the income quintiles. Hiring out labour outside the village is the largest source of income here. The poorest 20 percent in this village earn 48 percent of their income from hiring out their labour, which is the highest share from this source in all villages except Krasaing.

Income from agriculture is the lowest for the coastal region. There is a high dependency on hiring out labour to salt farms, and coastal fishing. In the coastal village of Kompong Thnaot, the better off generate most income from producing salt (this is self-employment outside agriculture). The poor, in contrast, mainly derive incomes from CPR, which is coastal fishing in this case.

6.4. Importance of Common Property Resources to Rural Livelihoods

The poor and the landless critically depend on CPR for their survival and/or supplementary income. The two distinctive CPR in Cambodia are fish and forest resources. Cambodia has the greatest quantity of freshwater fish in Southeast Asia. Cambodia is also well endowed with forests that provide the rich bio-diversity to support rural livelihoods. The forest cover was estimated at around 60 percent of the total land area in 1997 (Chan, Tep and Acharya 2001). Apart from timber, forests produce a variety of by-products such as rattan, resins, leaves, and fruits, all of which contribute to livelihoods. In this survey, CPR also includes edible insects, vegetables, and other aquatic edibles gathered from common fields and water bodies.

Table 6.1 shows the percentage of households in each of the nine villages that earned cash income from various types of CPR. There are a number of households that only use CPR for subsistence or personal consumption, not for income generation — this component is not enumerated here. It should, be borne in mind, therefore, that total benefits derived from CPR are greater than the data suggests here.

Fishing is the most important common source of income. A large number of households earn cash income from fishing even in two of the three villages in the Plateau region. Trapeang Prey is the only village where very few households generate cash from fishing since there are no water bodies there. In Kompong Thnaot, 69 percent of households derive their income from coastal fishing.

Hunting is confined only to those villages that have access to forests. Dang Kdar, located in the forest, is a village in which a considerable number of households (22 percent) earn incomes from hunting. Besides this, only Krasaing, located near inundated forests surrounding the Great Lake, has a notable proportion of households (8 percent) generating income from hunting.

Naturally grown vegetables, fruits, and tubers from forests also provide considerable income to many households in some of the villages. In Krasaing, almost half the villagers earn cash income from these sources, thanks to the wide availability of watercress (*Trakuon*) in the inundated rice fields. Andong Trach village, also located in the same part of the Tonle Sap Plain, shows a similar pattern. These resources are less available in Babaong, Kanhchor, Trapeang Prey and Kompong Thnaot.

Table 6.1. Percentage of Households Earning Income from Different Types of CPR

	Fishing	Hunting	Gathering vegetables ...	Other
Tonle Sap				
Andong Trach	85	2	34	12
Krasaing	65	8	48	17
Khsach Chiros	93	0	6	3
Mekong Plain				
Prek Kmeng	90	0	12	44
Babaong	37	0	1	5
Plateau				
Kanhchor	30	1	4	54
Dang Kdar	70	22	22	81
Trapeang Prey	3	0	0	18
Coastal				
Kompong Thnaot	69	0	0	3

The 'Other' category in Table 6.1 includes income from trees and by-products from forests, insects from fields, and aquatic edibles such as oysters. In Dang Kdar, 81 percent of the village households generate income from these resources. In Kanhchor, another village located near a forest, 54 percent of households generate income from this category, mainly through collection of leaves (Sloeuk Traing). In Prek Kmeng, 44 percent of the households generate cash income from collecting aquatic edibles.

In Trapeang Prey, no household earns income from hunting or gathering vegetables, fruits, and only 3 percent of households earn from fishing. Trapeang Prey households generate CPR income from catching frogs in the rice fields, digging tubers in nearby forests and cutting down some small trees in a distant forest, all of which are classified under the 'Other' column. In total, only about 21 percent of the households in Trapeang Prey earn cash incomes from CPR.

The total income earned from CPR, available by each village, was calculated from income from data for different types of CPR. The purpose of this calculation is to compare the significance of various types of CPR at the *village level* across the regions.

Total income from CPR in Prek Kmeng is the highest, on both a village and household basis. The village earns about 331 million riels in cash income each year from selling the fish they catch. This is in addition to consumption of fish and use of smaller fish as feed for raising larger fish. Of all the *cash* income earned from CPR in this village, 95 percent comes from fishing (Appendix 5, Tables 4 and 5). Next to Prek Kmeng is Kompong Thnaot, where 69 percent of the households generate a total income of about 253 million riels each year by fishing off the coast. This accounts for 99 percent of the village's total cash income from CPR

The three villages in the Tonle Sap region also generate large incomes from fishing. Khsach Chiros, a fishing village, earned cash income worth 222 million riels, which is 98 percent of total cash income earned from CPR. This is equivalent to 740,000 riels per household, the same as in Kompong Thnaot. Andong Trach and Krasaing also earn large cash incomes from fishing: 83 percent and 65 percent of total CPR income, respectively. For these two villages, income per-household from CPR is the highest in the sample.

Villages in the Plateau region do not have many water bodies, which is a disadvantage faced by the villagers in this region. Hunting is not a substantial source of income even among villages located near forests. In Dang Kdar, although a large proportion of people are engaged in hunting, cash income from this activity forms only about 7 percent of the total income from CPR.

Krasaing has a clear lead in gathering vegetables, fruits and tubers. Almost 50 percent of the households generate an average income of about 500,000 riels a year by collecting

vegetables from flooded rice fields. This resource accounts for 27 percent of the total cash income earned from CPR in the village. Apart from Krasaing and Andong Trach, gathering vegetables, tubers and fruits, provides little or no cash income elsewhere.

In short, this section illustrates the fact that not only is CPR pivotal to people's incomes; the variety of CPR is much greater than simply fishing and gathering wood.

6.5. Trends in the Availability of Common Property Resources

To examine trends in the availability of CPR, respondents were asked to compare the current availability of CPR to that available one-year and five years previously. Tables 6.2 and 6.4 outline the responses for one year previous.

The majority of households reported that there were less fish in 2001 than in 2000. In the nine villages combined, 66 percent of the households reported a decline in the fish stock, 18 percent reported an unchanged stock, and 16 percent reported an increase. Although these responses are not a scientific evaluation, the decrease, confirmed by an overwhelming majority of respondents, seems to be a clear indication that fish stocks in the nine villages have fallen. In Prek Kmeng and Khsach Chiros (inland fishing villages), the fish catch for 2001 was reported to be lower than in 2000. The coastal fishing village (Kompong Thnaot) also appears to have experienced a decline in the fish stock.

Table 6.2. Availability of Fish and other Resources from Water Bodies or Rice Fields Compared to One-Year Previously (percentage of households responding)

	Fish		Snails, Crabs...		Crickets...		Frogs		Vegetables	
	Same	Less	Same	Less	Same	Less	Same	Less	Same	Less
Tonle Sap Plain										
Andong Trach	15	43	43	43	50	50	13	63	35	55
Krasaing	29	40	-	-	33	67	80	20	42	8
Khsach Chiros	1	91	45	41	44	41	20	68	6	78
Mekong Plain										
Prek Kmeng	11	65	58	4	-	100	-	-	40	60
Babaong	21	64	22	78	-	100	-	100	-	11
Plateau										
Kanhchor	53	38	43	43	33	60	31	54	-	100
Dang Kdar	8	86	28	64	13	85	21	72	18	82
Trapeang Prey	24	67	23	34	21	61	2	82	33	38
Coastal										
Kompong Thnaot	25	74	47	29	83	17	46	22	100	0
All villages	**18**	**66**	**41**	**37**	**32**	**59**	**22**	**63**	**34**	**54**

Cambodians eat snails, crabs, oysters, crickets, frogs, and wild vegetables as a part of their diet. A much larger proportion of respondents reported a reduction in these edible items compared to those who found them the same.

Those who reported a decrease in the availability of resources also provided reasons for this reduction. These are presented in Table 6.3. Overall, 34 percent found over-exploitation to be the main reason for the decline, while 42 percent found the use of explosives and electrocution for catching fish to be destructive. Thirteen percent of households reported that a high population increase was responsible, and 10 percent of households cited restriction to open access as the main reason. The answers varied, as the significance of each reason is different from one village to another, depending on their specific conditions and constraints.

Table 6.3. Main Reasons for the Decline in Fish and other Water Resources (percentage distribution of respondents)

	Over-exploitation	Too high population increase	Others prohibited access	Use of explosives and electrocution	Open access is prohibited by law	Total
Tonle Sap Plain						
Andong Trach	42	15	3	27	12	100
Krasaing	7	22	0	70	0	100
Khsach Chiros	26	13	3	54	4	100
Mekong Plain						
Prek Kmeng	28	7	0	6	59	100
Babaong	9	34	0	55	2	100
Plateau						
Kanhchor	63	32	0	5	0	100
Dang Kdar	22	5	0	73	0	100
Trapeang Prey	0	15	0	85	0	100
Coastal						
Kompong Thnaot	100	0	0	0	0	100
All villages	**34**	**13**	**1**	**42**	**10**	**100**

Table 6.4 presents trends in the availability of firewood, timber, bamboo, wild animals, resins and mat making materials. Trends in Table 6.4 for all villages combined are similar to those seen in Table 6.2. The majority of households with access to any type of resource, reported that there was less now in 2001 than the previous year.

Table 6.4. Responses to Trends in the Availability of Forest and Related Resources Compared to One Year Previously (percentage distribution of households)

	Firewood		Timber		Bamboo		Wild Animals		Resins		Materials for Mats	
	Same	Less	Same	Less	Same	Less	Same	Less	Same	Less	Same	Less
Tonle Sap Plain												
Andong Trach	14	54	6	91	9	77	..	100	..	..	..	..
Krasaing	85	11	100	..	..	..	33	67	..	100	100	..
Khsach Chiros	16	78	..	100	50	50	..	100	..	50	30	61
Mekong Plain												
Prek Kmeng	19	79	100	..	..	100	..	..	..	..	25	75
Babaong	2	98	..	..	33	33	..	..	..	..	100	..
Plateau												
Kanhchor	46	53	2	98	..	100	..	50	..	..	..	100
Dang Kdar	57	43	5	95	25	75	..	100	3	97	29	57
Trapeang Prey	20	76	..	100	..	..	..	..	..	50	..	..
Coastal												
Kompong Thnaot	37	54	40	60	..	..	..	..	..	..	..	..
All villages	**31**	**64**	**16**	**83**	**13**	**72**	**3**	**92**	**2**	**89**	**23**	**69**

As stated in Chapter 2, almost all households in every village use firewood for cooking. In Khsach Chiros, Prek Kmeng, Babaong, and Trapeang Prey, more than 75 percent of the households reported a decrease in the availability of firewood. This is a major concern since other cooking means are either not available or unaffordable.

All villagers in Ksach Chiros and Trapeang Prey, and almost all villagers in Kanhchor, Dang Kdar and Andong Trach reported a decline in timber. This trend is similar to that for other resources. In Kanhchor, in response to restrictions of access to forests, most households are increasingly relying on collecting *Sloeuk Traing* (leaves). All respondents in this village, though, reported a fall in the availability of *Sloeuk Traing* as well.

Table 6.5. Responses to Main Reasons for the Decline in Forest Resources (percentage distribution of households)

	Over-exploitation	Too high population growth	Others monopolise the forest	Open access is prohibited by law	Total
Tonle Sap Plain					
Andong Trach	17	64	4	14	100
Krasaing	0	100	0	0	0
Khsach Chiros	20	52	0	28	100
Mekong Plain					
Prek Kmeng	43	49	8	0	100
Babaong	33	67	0	0	100
Plateau					
Kanhchor	69	22	0	9	100
Dang Kdar	67	5	26	2	100
Trapeang Prey	78	17	0	6	100
Coastal					
Kompong Thnaot	16	2	0	82	100
All villages	**39**	**40**	**5**	**15**	**100**

According to the respondents, over-exploitation and high population growth are responsible for the decreasing availability of firewood and forest resources (Table 6.5). At the 'all village level', 39 percent of the households having access to forest resources attributed 'over-exploitation', and 40 percent to 'too high population growth' as the main cause of decline in forest resources. In villages that benefit most from the forests (in the Plateau region), the majority of them found 'over exploitation' to be the cause of reduction in availability. What causes over-exploitation? While the survey data does not answer this question, other research suggest that with the introduction of an unregulated market economy, multiple stakeholders in all major sectors of natural resources have emerged for land, water, forests and fish (So *et al* 2001). In the absence of an efficient set of laws for the market, unscientific exploitation of resources has been widely reported. An increased population pressure compounds the problem.

Changes in the distance travelled to collect CPR are also important pointers of trends in the availability of natural resources. Villagers were asked to compare the distance from the village to water bodies/forests where they gathered resources in 2001 to that in 1998 (Appendix 5, Table 6).[41] For resources from water bodies, 70 percent of the responding households in the nine villages reported no change, while 30 percent said that they now had to travel further to catch fish or gather other aquatic resources. The distance to collect forest resources has increased considerably. In the mainly forest dependent villages of Kanhchor and Dang Kdar, 91 percent and 76 percent of households respectively reported that they now had to travel further to collect resources from the forests than before. Overall, 52 percent of all households reported that they now had to travel a greater distance to collect forest resources than previously

6.6. Summary

The most important results from data analysis in this chapter are:

a) Crop agriculture is only one of the sources of income in rural Cambodia, and not *the only source*, as is popularly believed. In many cases, it is not the most important source, especially for the poor. Wage labour is emerging as an important occupation.

b) As access to income from CPR becomes more difficult, villagers increasingly depend on labour-based income. However, since the wages for unskilled work are low, the

[41] The year 1998 was chosen as a year for comparison, because elections were held in that year and people recall the election year.

incomes of people who depend on labour-based rather than resource-based sources, are deteriorating.

c) CPR is made up of a variety of products that are important food products, but these are often not considered in surveys.

The average household income in the villages is well below the national average. Even in the most developed villages, a household earns only $923 a year, compared to the national average of $1,300.

In the resurveyed villages, agriculture has progressed remarkably since five years ago, increasing its share in the total income. Nevertheless, in at least one village, incomes from CPR and other non-farm self-employment have fallen drastically, to be replaced by incomes from wage labour. However, as stressed in this and previous chapters, returns from labour are lower than returns from other resources. Consequently, total incomes in this village have fallen.

Poorer households are more dependent than the non-poor ones on CPR for survival, though in absolute terms, the better off earn more from CPR. There appears to be a decline in the availability of CPR over time. Except in the villages that benefited from the partial release of fishing lots, incomes from CPR decreased considerably. Villagers now travel further to collect resources from forests and water bodies. They blame over-exploitation and illegal means of collection for any decrease in the availability of benefits from CPR (particularly fishing). Ultimately, the impact of the fall in incomes from CPR is greater for the poor than for the non-poor.

Chapter Seven

Consumption Patterns and Food Security

A lively debate on food security in low-income developing countries was initiated in the later part of the twentieth-century (Sen 1980; Dreze and Sen 1991). That debate continues to be relevant today both for those countries that produce adequate food, as well as for those that are deficient. Until a few years ago, Cambodia fell in the second category; however, after 1999 Cambodia's total food production rose to more than its total consumption, resulting in it being categorised in the first group.

In Cambodia, as elsewhere, total food production has risen in recent years because some areas and/or some farmers in a few provinces have begun to produce large food surpluses. At the same time, there are farmers and non-farm workers with limited resources, who dwell in both deficit as well as surplus areas who do not earn enough to permit them sufficient access to food all around the year. They face problems of food deficiency in certain seasons or even round the year. There is no automatic mechanism by which the surplus food of a few can find a way to those who face deficit. The celebrated 'entitlements approach' to poverty essentially articulates how, and by what mechanisms, some possess entitlements to food while others do not (Sen 1980).

The debate on poverty, first addresses the question of food: whether all are able to access food; Next, it examines access to consumption beyond food — mainly other essential commodities and services. Each of these aspects is relevant to village dwellers in Cambodia.

The purpose of this chapter is:

1) To assess the extent of food and other consumption, on the aggregate level as well as by economic groups.
2) To measure the extent and depth of poverty.
3) To determine seasonality in food availability.
4) To compare, to a limited extent, the results of this survey with those from the survey that CDRI conducted in 1996–97.

Since this survey was conducted in two rounds, it has been possible to assess the food situation both when there can be more food available (the dry season) and less food available (the wet season). Data was collected on food consumption by each major consumption item. In addition, information was obtained on non-food items, both durable and non-durable. The recall period for food consumption is one week, and for non-food items, one week to six months, depending upon the item. For many items, produced (or collected) for personal consumption, the market value has been applied to judge its value. In fact, the whole exercise here is based on denominating all food and non-food items into their monetary values. This may have been a cause for bias, since prices may not always correspond to the food or use

value of an item in this setting. Nevertheless, there was no way around this since it is impossible to make an assessment of total consumption, or compare consumption across households, based only on physical units.[42]

Poverty in low-income countries is measured by nutritional norms. A nutritional norm of 2,100 calories per adult per day is considered the minimum, below which a person is deemed to be below the poverty line. However, since each person has different food choices, tastes and personal nuances, it is usually accepted that if a person is able to buy or access food worth 2,100 calories worth of food, they are not below the poverty line.

7.1. Aggregate Food Consumption

7.1.1. Total Food and Rice Consumption

Table 7.1 provides data on monthly food consumption per-capita, for food and non-food items, averaged at the village level. This table presents figures in riels. The first comparison made is that for village differences in consumption patterns.

Table 7.1. Food Consumption and Total Expenditure for 2001 and 1996–97 (per capita, per month)

	Food expenditure		Total expenditure
	Riels/month	Percentage of total expenditure	Riels/month
Tonle Sap			
Andong Trach	20,910	72	28,866
Krasaing	23,143	57	40,422
Khsach Chiros	24,098	72	33,694
Mekong Plain			
Prek Kmeng	33,925	70 (78)	48,786
Babaong	22,719	59 (69)	38,554
Plateau			
Kanhchor	25,588	70	36,396
Dang Kdar	21,936	70	31,387
Trapeang Prey	17,563	78 (66)	22,393
Coastal			
Kompong Thnaot	37,933	73	51,655
All villages	**25,832**	**68**	**37,921**

Note: figures in brackets refer to 1996–97 data.

The average total expenditure, aggregated across the nine villages, was 37,921 riels per capita, per month, with a high of 51,655 in Kompong Thnaot, a coastal area, and a low of 22,393 riels in Trapeang Prey, a deficit area in the Plateau region. Prek Kmeng and Krasaing exhibit a relatively high quantity of average expenditure per capita — higher than the average — while Andong Trach, Dang Kdar and Khsach Chiros appear to exhibit lower total expenditure per capita. Kompong Thnaot shows a very high figure of overall consumption. The reason for this is that people in this village eat a lot of seafood, which is priced higher in the market. Admittedly, not everyone buys seafood as large numbers provide seafood for their own personal consumption (Kim, Chan and Acharya 2002).

[42] In many studies, scholars have calculated the calorific values of food for each food item. This method is meticulous, but it is impossible to obtain the calorific values of foods when there is a vast variety of fish, meat, vegetables and fruit, and even rice, that people consume.

The aggregate share of food in total consumption (for all the villages) is 68 percent, which is very close to what the SES of 1997 and 1999, and the earlier CDRI survey also estimate.[43] Krasaing and Babaong stand apart from other villages in terms of having a rather small total share of food consumption. The share of food in total household expenditure in these two villages is less than 60 percent, while in the other villages this proportion is 70 percent or more. A lower share of food as part of household expenditure usually implies more affluence, since the poor can hardly afford to spend much on non-food items. These two villages are rice surplus and the fact that they are more affluent cannot be ruled out. The two rice deficit villages, Trapeang Prey and Andong Trach, are at the bottom, while Khsach Chiros and Dang Kdar —without rice surplus — are also below the average. All of them show a very high share of food in total consumption. Can it be concluded that, being surplus in rice is co-terminus with a higher standard of living at the village level? To answer this question, more analysis follows later in the chapter.[44]

Table 7.2 presents data on rice consumption, in physical terms, as measured in adult units per capita.[45] This table presents data by the two rounds, for the current 2001 survey.

The mean rice consumption across villages is remarkably stable: the lowest is 0.47 kg per day in Prek Kmeng (averaged over two rounds), and the highest is 0.55 kg, in Khsach Chiros. This small variance in rice consumption contrasts sharply with the large variation across villages in the *total* food consumption measured in monetary units, where the inter-village variation could exceed 100 percent, (about 1,995 riels per adult unit in Kompong Thnaot, versus about 769 in Trapeang Prey). These data suggest that villagers aim to ensure some minimum rice consumption for themselves, *i.e.* food security is primarily maintained by *rice* consumption, while adjustments are made in the consumption of other food items to match budgets.

Table 7.2. Per Adult Unit Consumption of Rice and Total Food by Seasons

	Consumption of Rice (Kg/day)			Total Food Consumption (Riels/day)		
	Round 1 Dry Season	Round 2 Wet Season	(Percent change)	Round 1 Dry Season	Round 2 Wet Season	(Percent change)
Tonle Sap Plain						
Andong Trach	0.48	0.50	4.6	944	889	-5.8
Krasaing	0.49	0.49	0.2	1,156	939	-18.8
Khsach Chiros	0.56	0.55	-2.3	1,277	902	-29.4
Mekong Plain						
Prek Kmeng	0.46	0.49	6.2	1,526	1,581	3.6
Babaong	0.48	0.46	-3.7	1,107	831	-24.9
Plateau						
Kanhchor	0.51	0.48	-5.4	1,251	976	-22.0
Dang Kdar	0.49	0.53	8.5	983	912	-7.3
Trapeang Prey	0.47	0.51	6.5	784	754	-3.8
Coastal						
Kompong Thnaot	0.51	0.46	-9.7	1,814	1,517	-16.4
All villages	**0.49**	**0.49**	**-0.1**	**1,234**	**1,051**	**-14.8**

[43] The SES-99 shows a figure of 69 percent for rural Cambodia. Figures for the 1996–97 survey are in brackets in Table 7.1. In absolute terms, each of these is a rather high number, which is typical to a low-income country.

[44] In Cambodia, however, unlike in many low-income countries, people do not necessarily always substitute food for non-food and vice-versa, as is believed in much literature on development. This is because other, non-food priorities are equally as pressing; for example, expenses on illness are large and unavoidable (Biddulph 2000). Hence, firm conclusions based on just these numbers could be hasty.

[45] Such a correction takes care of biases emerging out of the differential age distributions across households in the population.

Rice consumption appears to be fairly stable between the two rounds as well: in most of the villages, there is less than a 5 percent change in rice consumption between the two rounds. However, the fact that villagers reduce their overall food consumption in the lean months is fairly evident from a more than 15 percent reduction in the total food consumption, as seen from Table 7.2. This holds for eight out of the nine villages; only in Prek Kmeng has the total food consumption shown a slight increase in the wet season survey. This is because Prek Kmeng is inundated during the wet season and relies exclusively on dry season rice and fish; these months are not necessarily lean in that village.

These statistics imply that villagers either store rice for the whole year, or they substitute rice for other commodities during the lean season. In reality, it could be a combination of both.

7.1.2. Food and Rice Consumption by Expenditure Deciles

Figure 7.1a, which presents data on rice consumption by expenditure deciles, suggests that there is little difference between the rice consumption of the affluent and the non-affluent. This again indicates that both rich and poor aim to attain a certain level of rice consumption a similar amount — after which, those who can afford to, switch to additional items. However, there is a large gap in 'total food consumption' for both rounds between the affluent and non-affluent (Figure 7.1b). The consumption gap between the top expenditure decile and the bottom one could be more than four times. As stated earlier, this certainly confirms that villagers make adjustments in non-rice food consumption rather than in rice.

Figure 7.1a. Rice Consumption by Deciles and Season (kg per day per adult unit)

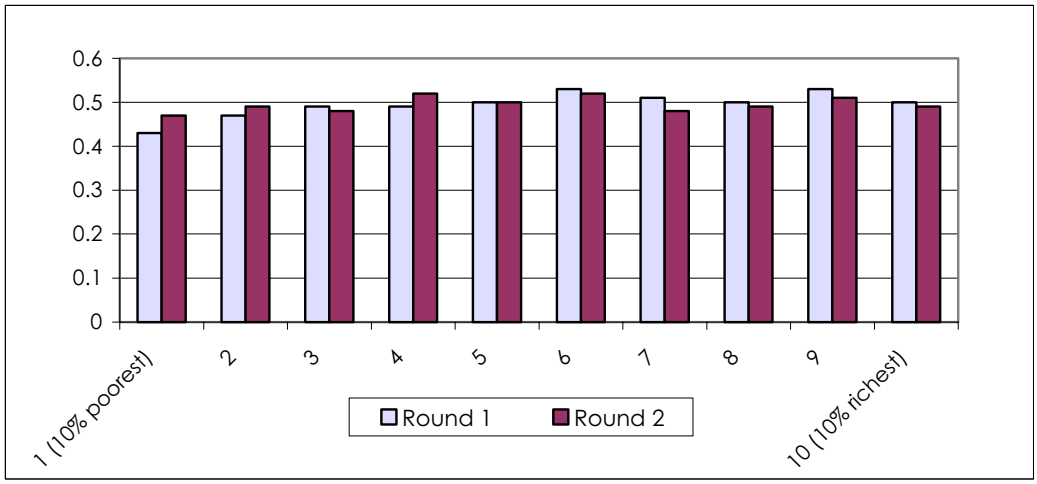
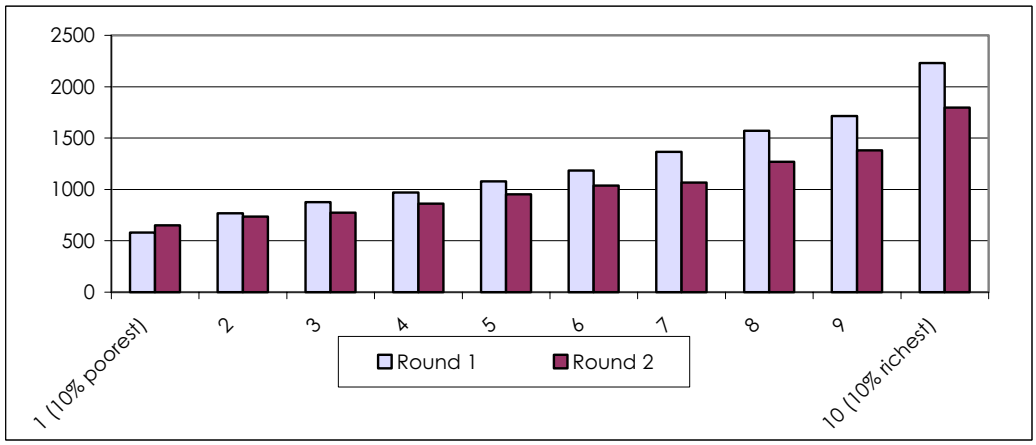


Figure 7.1b shows a seasonal change in rice and total consumption. These data show that the lower expenditure groups generally maintain their levels of rice consumption through the lean seasons, while the upper expenditure groups make a downward adjustment. A similar adjustment is reflected in the total food basket as well. These statistics are somewhat puzzling. Perhaps, the lower expenditure classes do not change very much between the seasons because they consume less and cannot reduce consumption further, lest they go hungry. At the other end, the rich probably cut on their excess consumption. It could therefore be argued that there is no abject poverty in these villages; it is for this reason that the poor are able to maintain their food consumption even in the lean seasons. It could also be inferred that no households could be termed as 'rich' in absolute terms: households in the top expenditure bracket are also forced to cut consumption in the lean months.

At the aggregate village level, analysis reinforces the point that villagers maintain a certain level of rice consumption and make adjustments in non-rice and non-food items.

Figure 7.1b. Total Food Consumption by Decile and Season (riels per day per adult unit)



7.1.3. Comparison of Rice Consumption Between 1996–97 and 2001

A comparison of adult unit rice consumption per capita in 2001, with that seen from the 1996–97 survey suggests that in each of the three villages that were resurveyed (Prek Kmeng, Babaong and Trapeang Prey), there has been some reduction in rice consumption (Table 7.3). In the first and third village, the reduction in rice consumption is in the range of 3–4 percent, while in the second, it is 11–12 percent. What could be the cause for this?

1. Is there an actual *increase* in poverty,
2. Has there been a substitution for rice by other foods, or
3. Is there a data adjustment bias while calculating adult equivalent units

Table 7.3. Rice Consumption per Capita per Day: Adjusted for Adult Unit and Unadjusted

	Wet season			Dry season		
Village	**1996**	**2001**	**% Change**	**1997**	**2001**	**% Change**
	(Kg/day per Adult Unit)					
Prek Kmeng	0.51	0.53	4	0.53	0.49	-7
Babaong	0.59	0.56	-5	0.56	0.46	-18
Trapeang Prey	0.56	0.54	-3	0.54	0.51	-6
	(Kg/day per Capita)					
Prek Kmeng	0.37	0.38	4	0.39	0.36	-7
Babaong	0.45	0.38	-15	0.43	0.43	-6
Trapeang Prey	0.37	0.41	11	0.40	0.40	-3

The last question is considered first. To calculate figures in Table 7.3 adult unit equivalents have been worked out. An adult female is taken to eat the equivalent of 0.8 of an adult male amount, and a child is equivalent to 0.5 of an adult male amount. A demographic change between the two years could create a bias here. To look at the problem differently, unweighted consumption per capita is calculated for the two periods. These data show that the rice consumption gap only marginally reduces even if the unweighted consumption averages are compared, suggesting that the age-specific adjustment has not created any significant bias. This then leads to the second question: there surely is a strong possibility of substitution between rice and other foods, at least in two of the three villages, as was also seen earlier. The absolute quantity of money spent on food in Prek Kmeng was 660 riels a day in 1996–97 against 1,553 in 2001. In Babaong, it was 764 riels in 1996–97, against 969 riels in 2001, and in Trapeang Prey, it was 840 riels in 1996–97 against 769 in 2001. In Prek Kmeng and Babaong, the monetary value of average food consumed has increased. A fall in consumption

in Trapeang Prey could point towards a fall in the standards of living. The first question about change in poverty is addressed later in the chapter.

7.2. The Food Basket

The food people eat is varied, which for the sake of convenience has been grouped into rice; other cereals; meat, fish and eggs; vegetables; oils and fats; fruits; and other miscellaneous food items. The percentage values of these are presented in Table 7.4

Table 7.4. Food and Consumption Per Adult Unit (average of wet and dry surveys)

	Rice	Other cereals	Meat, fish, etc.	Vege-tables	Oil and fats	Fruits	Others	Total food
Tonle Sap Plain	(Percentage of total food consumption)*							
Andong Trach	37.1	7.2	28.1	9.3	2.4	6.7	9.2	100.0
Krasaing	30.6	10.7	33.3	7.8	2.1	5.0	10.4	100.0
Khsach Chiros	35.4	4.3	24.1	9.2	3.7	8.3	15.0	100.0
Mekong Plain								
Prek Kmeng	20.6	6.8	37.3	12.3	2.9	5.2	14.9	100.0
Babaong	25.1	5.3	38.6	10.7	2.8	5.6	11.9	100.0
Plateau								
Kanhchor	31.4	5.1	32.6	10.3	2.8	5.6	12.2	100.0
Dang Kdar	35.8	7.1	28.8	8.0	2.5	6.9	10.8	100.0
Trapeang Prey	41.0	4.8	31.5	7.5	2.0	4.0	9.2	100.0
Coastal								
Kampong Thnaot	21.0	6.2	43.2	7.2	2.4	8.1	11.9	100.0
All villages	**28.8**	**6.5**	**34.2**	**9.3**	**2.7**	**6.4**	**12.2**	**100.0**

**See Appendix 6, Table 1, for expenditure given in riels.*

It is of interest to note that while rice is the most important component of food in Cambodia, it does not command the largest *share* in the household food budget. On average, the proportion of rice in the total food basket is less than 30 percent, though in the more rice deficit villages, it is higher. The item on which maximum expense is incurred is meat (including fish and eggs), though in reality, part of this might be self-provided.[46]

It was found earlier that there is high seasonal and expenditure-quintile specific volatility in the consumption of non-rice food items. To examine this component further, the percentage ratio of non-rice food expenditure in the wet season, to non-rice food expenditure in the dry season was calculated. In the lean, wet season (Round 2), the aggregate expense on non-food items is reduced to 78 percent of that in the dry season survey.[47] Maximum reduction is shown in the consumption of fruits, vegetables and other items such as snacks, tea and coffee, while meat and related products and oil and fats are subject to less volatility (Appendix 6, Table 2). In eight villages there is a reduction, while in Prek Kmeng there is no change for reasons already explained earlier. While rice is grown or purchased by the households, other foods are purchased/bartered, caught (fish), gathered (vegetables, fruits), or reared at home (animals/poultry). In the lean season, the purchase of the latter is reduced for want of cash; at the same time, some of the seasonal catch is not available during this time. It is also observed that to buy rice, some villagers with limited cash trade out other food items in the lean season (Kim, Chan and Acharya 2002). This explains why there is a higher reduction in non-rice consumption in the lean season.

[46] Market participation, though, is quite high in these villages, ranging from 65–75 percent, depending upon the socio-economic class and item under consideration. It is believed that a great part of this is barter between members of the village community. The earlier survey also found this phenomenon (see Murshid 1998).

[47] This contrasts with virtually no change in rice consumption, as seen in Table 7.2 (physical terms) and an *increase* by 8 percent in monetary terms.

7.3. Non-Food Consumption

A breakdown of the non-food consumption basket by its constituents can be seen in Table 7.5 below.

Table 7.5. Percentage Share of Different Non-Food Consumption Items 2001 and 1996–97 (calculated from per capita adult unit expenses)

Village	Clothing	Health	Education	Ceremonies	Other	Total
Tonle Sap						
Andong Trach	19	35	15	16	15	100
Krasaing	12	28	25	16	19	100
Khsach Chiros	16	44	7	18	15	100
Mekong Plain						
Prek Kmeng	14	40	10	24	13	100
	(8.8)	(61.4)	(11.2)	(7.4)	(11.1)	(100)
Babaong	13	45	8	26	8	100
	(4.7)	(54.1)	(10.5)	(13.5)	(17.1)	(100)
Plateau Region						
Kanhchor	12	36	14	23	15	100
Dang Kdar	13	55	7	20	6	100
Trapeang Prey	12	30	13	28	18	100
	(NA)	(48.2)	(NA	(NA)	(NA)	(100)
Coastal						
Kompong Thnaot	15	19	24	29	14	100
All villages	**14**	**37**	**14**	**22**	**13**	**100**

Note: Figures in the brackets are data for 1996–97. Not Applicable (NA) refers to the fact that data cannot be matched with the current survey.

This table suggests that, on average, more than a third of total non-food expenses are incurred on health, which is the largest single expenditure item in the non-food consumption category. The share spent on health is particularly high in Khsach Chiros, Babaong, and Dang Kdar, exceeding 40 percent of all non-food expenditure. In Babaong, where the food share in the total expenditure is only 57 percent, it is suspected that there is a reduction on food expenses to meet expenses on illness (see footnote 43). In absolute terms, the highest expense on health is seen in Babaong, at 7,064 riels per month for each person. A comparison of the three villages with the 1996–97 survey, shows that in that year an even higher proportion of non-food expense was spent on health related activities (see figures in brackets). In Krasaing, the non-food share is high due to the expense on education being very high — the highest in this sample at 4,235 riels per month for each person.

On aggregate, health expenses form about 9–10 percent of a household's total household consumption. This ratio is high when incomes are as low as they are in these villages.

Figure 7.2a shows the seasonal change in non-food consumption across the villages. There is a significant reduction in non-food expenditure in the lean season at the all-village level. No discernible pattern, however, is observed across the villages. An aggregate reduction of 42 percent in non-food items between the two seasons is higher than that seen for rice or non-rice food items. This implies that villagers make reductions in non-food items rather than food items.

Figure 7.2b, which shows the seasonal reduction in non-food expenditure for the whole sample (all nine villages), by expenditure deciles, suggests that, at best, there is a weak association between being affluent and not having to reduce expenditure. This statistic points to the fact that the differences between the rich and poor are not very large — everyone is forced to reduce expenses. This aspect was observed earlier as well.

Figure 7.2a. Change of Non-food Consumption by Village Between Round 1 (Dry Season) and Round 2 (Wet Season). Riels per day per adult unit

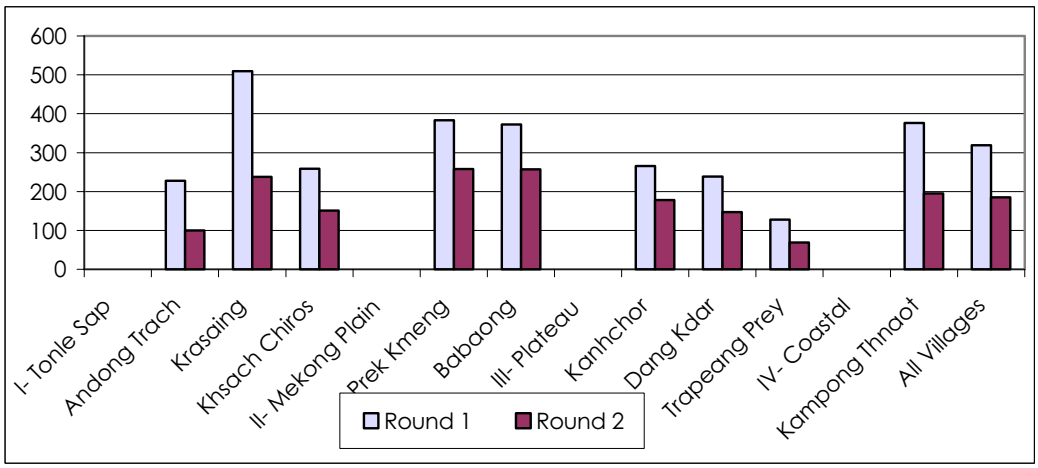
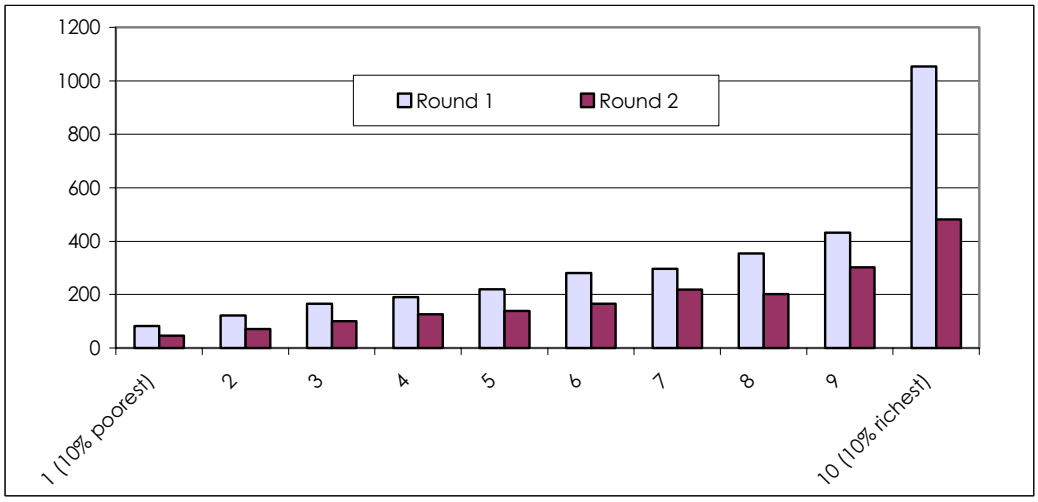


Figure 7.2b. Change of Non-food Consumption by Decile between Round 1 (Dry Season) and Round 2 (Wet Season). Riels per day per adult unit



7.4. Engel Elasticities

Engel elasticity is the elasticity (percentage change) in the consumption of a specific consumption item in response to changes in total income. Engel elasticities are estimated to judge the nature of consumer response when incomes change. These elasticities help in policy analysis in a number of ways, like determining the essential character, substitutability, or inferiority/superiority of a commodity. In some countries, Engel elasticity values guide rationing and price control of certain commodities in the event of market failure or extreme shortage.

The simplest and most robust method employed to determine Engel elasticities is to estimate double logarithmic regression models with individual items being the dependent variable, and total income as the explanatory variable. The equation looks like:

$$\text{Ln}(\text{Item}_i) = A + B \text{ Ln}(\text{Total Income})$$[48]

[48] The value of Engel elasticity is the estimated coefficient B, and A is the intersect. Ln is the natural logarithm of the item or income.

In the present analysis, total income is substituted by total consumption. The dependent variables are, alternatively, rice, meat, fish etc., non-rice food, non-food expenditure, and health expenditure, in the four equations fitted using the Ordinary Least Squares method. Estimates are presented for the whole sample; equations are not presented by village because the coefficient values do not differ significantly across the villages.

Table 7.6. Engel Elasticities for Rice, Non-Rice Food, Non-Food Items and Health*

Rice	Non-rice food	Meat, fish, etc.	Non-food	Health
0.46	0.75	0.91	0.74	0.51

**All estimates in this table are statistically significant at 0.01 percent confidence.*

Engel elasticity estimates, presented in Table 7.6, suggest that rice consumption does not rise very much as total consumption rises. This is consistent with the earlier finding that people aim to ensure a certain amount of rice for themselves, but do not increase rice consumption in proportion to rising income. Non-rice food is more elastic; in fact, meat and fish are in high demand — as incomes increase, meat consumption increases in almost the same proportion. Non-food items and non-rice food items have similar elasticity values. However, health expenditure has a lower elasticity value — though not quite as low as that of rice — implying that health related expenses appear to be in the same category as essential consumption items: people have to expend a certain amount on health. The amount does not necessarily rise very fast with incomes, which also implies that the poor spend disproportionately high on this item.

The Engel elasticities estimated above provide a statistical basis for the earlier findings about consumer behaviour.

7.5. The Poverty Line and Poverty Comparisons

An assessment of food security or sufficient food consumption cannot avoid a discussion of poverty. As stated at the beginning of this chapter, in low-income countries a person is identified to be below the poverty line if they consume food of less than a certain stipulated amount. In Cambodia, this amount is equivalent to 2,100 calories per day. The usual method to estimate the poverty line is to find out how much cash is required to buy food equivalent to 2,100 calories, with a small allowance being added to account for non-food items.[49]

For analysis in this chapter, a poverty line has been calculated for each village. This is because aggregate poverty lines constructed at the national level tend to impose national level prices (as well as the consumption basket averaged at the national level) on each village and household and this may not be very realistic for village-level analysis. CDRI previously calculated poverty lines for three villages in its earlier surveys, using the calorific values of foods locally consumed. For these three villages (Babaong, Prek Kmeng and Trapeang Prey), the same poverty lines have been upgraded using price data from the quarterly cost-of-living surveys conducted by CDRI. For the other villages, adjustments have been made with respect to consumption baskets, as well as prices, to arrive at local poverty lines.

Table 7.7 shows the poverty lines: a food poverty line, and total poverty line obtained by adding a 20 percent margin to the food poverty line. The same method was followed in 1996–97. It may be noted that the poverty line is much higher in Kompong Thnaot because food in that area is largely composed of catch from the sea, which is priced higher than the predominantly rice-based meals elsewhere.

[49] While the usual practice is to make a normative judgement on what should be a real figure for non-food consumption based on the actual consumption in the second or third deciles in the distribution of households by consumption expenditure, more sophisticated exercises fit regression models for estimating Engel curves for determining non-food consumption. See RGC (2001), Appendix 3.

Table 7.7. Poverty Lines and Proportions Living Below Poverty Line (by village)

Villages/Poverty lines	Food Poverty Line (riels/day)	Poverty Line (riels/day)	Percent below poverty line 2001	Percent below poverty line 1996–97
Tonle Sap				
Andong Trach	855	1,069	51	
Krasaing	898	1,123	33	
Khsach Chiros	984	1,230	45	
Mekong Plain				
Prek Kmeng	994	1,243	15	48
Babaong	901	1,126	25	43
Plateau				
Kanhchor	1,046	1,308	43	
Dang Kdar	1,080	1,350	62	
Trapeang Prey	888	1,110	72	50
Coastal				
Kompong Thnaot	1,194	1,492	12	
All villages	**982**	**1,228**	**38**	

Table 7.7 also provides data on the number of persons who fall below the poverty line, as seen from the 2001 and 1996–97 surveys. In 2001, the number of villagers subsisting below the poverty line was an aggregate 38 percent for the nine villages.[50] The relatively well off villages were Prek Kmeng, Babaong and Kompong Thnaot: the proportions below the poverty line in these villages were 15, 25 and 12, respectively. Krasaing had fewer living below the poverty line compared to the average of the nine villages. At the other end of the spectrum was Trapeang Prey with 72 percent of its villagers living below the poverty line and then Dang Kdar with 62 percent. In Andong Trach, Khsach Chiros and Kanhchor, a considerably large proportion of villagers — higher than the average — were living below the poverty line. Those villages that have smaller proportions living below the poverty line are also the ones that are either surplus in rice or are well endowed with fish resources. Fish availability and crop surplus conditions do therefore matter in the determination of standards of living.

A comparison of the proportions subsisting below the poverty line in 2001 and in 1996–97 (which also answers the question raised earlier in this chapter), shows that in Prek Kmeng about 33 percent have moved above the poverty line. In Babaong about 18 percent moved above the poverty line. Only in Trapeang Prey did poverty proportions worsen: there were 28 percent more living below the poverty line in 2001 than in 1996–97. While these changes in poverty proportions appear sizeable, large changes can be expected in micro settings. For example, the reduction in poverty could be effected by increased fishing activities, some agricultural growth, development schemes and aid (Prek Kmeng), or agricultural modernisation and growth (Babaong). In Chapter 4, it was noted that Prek Kmeng had enjoyed huge fishing gains and Babaong had enjoyed high agricultural growth using modern rice varieties, fertilisers and controlled irrigation regimes. In areas where there has been resource-based development, incomes have risen; and if these incomes accrue relatively more equitably, poverty is reduced. This has been the case in Babaong and Prek Kmeng. An increase in poverty in Trapeang Prey could possibly have happened because of a combination of landlessness, a shrinking occupational base, and a vanishing natural resource base. In Trapeang Prey, agricultural growth has been achieved through crop diversification. However, crop diversification in Cambodia has so far been possible only on larger plots of land where those farmers, who possess large land plots, can apportion a part of it for non-paddy crops. In short, the incomes from agriculture only accrue to the non-poor; the poor have to earn a living from hiring out labour, and at the present level of wages, not many are able to move above the

[50] These poverty estimates are quite close to those from the SES of 1997 and 1999.

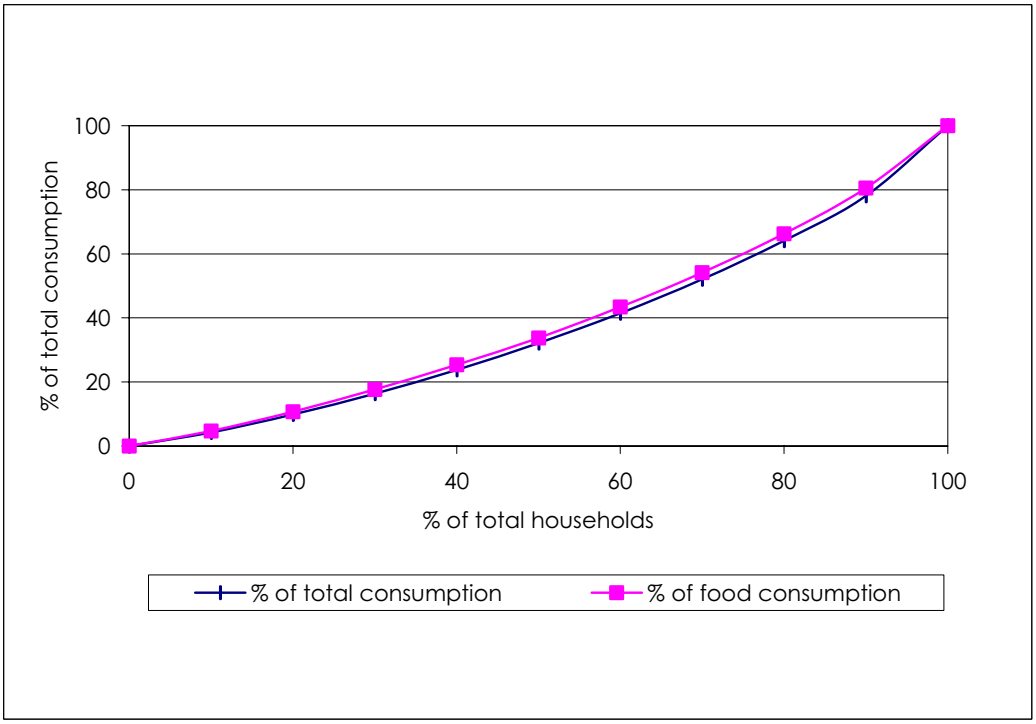
poverty line. On the contrary, the higher the reliance on wage labour, the more the chances of the individual to drop below the poverty line. Such observations have been made in other parts of Asia as well (Visaria 1980; Kim, Chan and Acharya 2002:23–31).

7.6. Population Distribution by Consumption Expenditure and Extent of Poverty

7.6.1. Extent of Inequality

A Lorenz Curve, which is a graphical representation of inequality (in this case of consumption), is a cumulative distribution of households and expenditures drawn on two axes of a two-dimensional space. The further the curve is away from a straight line joining the two opposite vertices, the higher the inequality, and the closer it is to a straight line joining the two vertices, the lower the inequality. Figure 7.3 below, shows the Lorenz Curve of consumption expenditure drawn from pooled data of all the villages. It exhibits very much what the data in Figures 7.2a and 7.2b illustrate that the extent of spread of expenditures across households in this sample is not very high. It also shows that inequality in food consumption is somewhat less than that in total consumption. The implication is that the extent of inequality between the rich and the poor is not very high — at least for consumption.

Figure 7.3. Lorenz Curve of Food and Total Consumption Expenditure



To consider the extent of inequality, the Gini coefficient of inequality has been calculated for each of the villages.[51] This coefficient assumes a value (=1) for absolute inequality and (=0) for absolute equality. The values, calculated from village level data, can be seen in the Gini Coefficient column in Table 7.8. At the aggregate level, seen in the context of other agrarian

[51] A Gini coefficient is a numeric equivalent of what a Lorenz Curve exhibits graphically. It is the ratio of the area between the curved line and the straight line joining the two vertices, and the area under the right-angled triangle formed by joining the two opposite vertices.

countries, the consumption inequality is low here.[52] Next, the Gini coefficient does not show any discernible relationship with poverty ratios. This is quite plausible because low overall consumption (*e.g.* Trapeang Prey) would imply low inequality, but at the same time, high poverty. At the same time, high overall consumption could also be accompanied by equitable consumption, which would result in low inequality as well as low poverty ratios. Other combinations are possible as well.

The limited inference from this analysis suggests a firm statistical basis for a small inequality of consumption between households.

Table 7.8. Consumption Expenditure Classes (by percentage distribution of population)

Village/ expenditure class	Gini Coefficient	Average poverty line = 1,228 riels/day; food poverty = 982 riels/day				
		<=75% of poverty line	75% - 100%	100% - 125%	125% - 150%	150% -
		Very poor	Moderately poor	Medium	Medium high	Better off
Tonle Sap						
Andong Trach	0.26	31 (36)	33 (32)	14 (15)	13 (7)	9 (9)
Krasaing	0.29	11 (23)	18 (30)	28 (23)	17 (14)	28 (11)
Khsach Chiros	0.28	18 (21)	28 (28)	17 (19)	13 (12)	25 (21)
Mekong Plain						
Prek Kmeng	0.25	1 (2)	10 (8)	14 (16)	14 (19)	61 (55)
Babaong	0.24	14 (26)	17 (35)	24 (17)	20 (13)	25 (9)
Plateau						
Kanhchor	0.24	8 (6)	28 (38)	21 (26)	21 (16)	23 (15)
Dang Kdar	0.23	21 (30)	28 (33)	27 (20)	12 (10)	12 (7)
Trapeang Prey	0.19	49 (46)	40 (43)	9 (9)	1 (3)	1 (0)
Coastal						
Kompong Thnaot	0.21	1 (2)	11 (9)	20 (21)	29 (25)	39 (43)
All Villages	**0.24**	**15 (19)**	**22 (27)**	**20 (19)**	**17 (14)**	**27 (21)**

Note: figures in the brackets are poverty proportions calculated for food expenses against the food poverty line.

7.6.2. Poverty and Inequality

Using the poverty line outlined in the previous section, it is possible to examine distribution around the poverty line, to examine whether it is egalitarian or skewed. Table 7.8 also provides data on the distribution of households using categories of consumption. The very poor are defined as those whose consumption is 25 percent below the poverty line. The moderately poor are defined as those whose consumption is either at the poverty line or up to

[52] See Khan and Lee (1984) and Srinivasan and Bardhan (1988) for some international comparisons in Asia. The World Bank (see World Bank 2001) also reproduces figures on the extent of inequality in incomes and consumption, but they are not published separately for rural areas.

25 percent below. Medium, non-poor are defined as consuming between the poverty line and up to 25 percent higher. Medium-high, non-poor are defined as consuming between 25–50 percent higher than the poverty line and those consuming more than 50 percent above the poverty line are categorised as the better off. The poverty line, in this table, is the average for all the nine villages. Two measures are used: the food poverty line and the poverty line based on total expenses. In the case of the former, only those expenses incurred on food are compared with the food poverty line.

On aggregate, this table does not show very high abject poverty: only about 15 percent of the households are very poor — 19 percent when measured by the food poverty line. At the same time, there are not very many who are better off. On aggregate only about a quarter of the households (a fifth, when measured by the food poverty line), consume at levels more than 50 percent above the poverty line.

In villages like Prek Kmeng and Kompong Thnaot there are virtually no 'very poor'. However, in villages like Trapeang Prey, almost half the population is very poor; in fact, in that village only 1 percent is better off (*i.e.* consumption is 50 percent higher than the poverty line). The other village that comes close to Trapeang Prey is Andong Trach where nearly a third of the households are very poor. In villages where there are more poor, there are also more 'very poor', and the vice versa.

The poverty gap and poverty intensity indices, commonly referred to as Foster Greer and Thorbecke (FGT) indices — named after their authors — measure the depth of poverty below the poverty line. The general formula is as follows:

$$PG^{\alpha} = (1/n)\ \Sigma[(Z - Yi)/Z]^{\alpha} \text{ (for a k-member group; } k <= n)$$

Where n is the size of the population, Yi is the income (expenditure) of the i^{th} individual below the poverty line, Z is the poverty line, and PG is the index. This index, if α=0, reduces to the headcount ratio, for α=1 it represents the poverty gap index, and for higher values of α, it is referred to as the poverty intensity index. This is because the higher the value of α, the more weight is attached to the inequality in this compound index, which combines the poverty head count with the depth of poverty below the poverty line. Table 7.9 provides estimates of PG for α=1 (poverty gap), and α=2 (intensity of poverty).

Table 7.9. Measures of Poverty Gap and Poverty Intensity, 2001 and 1996–97

Villages	Poverty gap 2001(%)	Poverty intensity 2001(%)	Poverty gap 1996–97(%)
Tonle Sap			
Andong Trach	10.7	3.1	
Krasaing	4.4	1.4	
Khsach Chiros	10.2	3.5	
Mekong Plain			
Prek Kmeng	1.6	0.3	18.0
Babaong	5.1	1.5	16.0
Plateau			
Kanhchor	7.7	2.0	
Dang Kdar	15.7	5.5	
Trapeang Prey	18.5	6.4	16.0
Coastal			
Kompong Thnaot	1.3	0.2	
All villages	**8.2**	**2.7**	

This table confirms the earlier findings that at the aggregate level the poverty gap and the intensity of poverty are not very high, meaning that large majorities of the poor are not too far from the poverty line.[53] As found earlier, in at least two villages — namely Dang Kdar and

[53] Analysis based on SES 1999 also yields similar results. See RGC (2001).

Trapeang Prey — where the absolute poverty was found to be high, the poverty gap is also large. Next, a comparison with the earlier survey of 1996–97 suggests a similarity only in Trapeang Prey. In Prek Kmeng and Babaong the poverty gaps have fallen sharply, which is consistent with the earlier finding that poverty has fallen by head count in these locales.

It can be reiterated that poverty is low (and has fallen) in villages that have high rice productivity and have access to natural resources (particularly fish). Conversely, the proportion of poverty is high in poorly endowed or isolated villages, or where villagers earn their living from wage labour. In brief, the natural resource base of a village still determines the standards of living of people.

7.7. Summary

This chapter finds that there are large regional and seasonal changes in total household expenditure. Food consumption constitutes up to 68 percent of total expenditure, though it varies from between 59–78 percent in different villages. The more affluent villages spend a lower proportion of income in the form of food. Rice consumption is relatively inelastic, meaning that people aim to consume a stable proportion of it, irrespective of their socio-economic class. Other non-food items are more elastic; people reduce their consumption in lean seasons, with the poor cutting back the most. Health expenditure, though, is inelastic. This implies that both, poor and non-poor have to spend a near non-negotiable 10 percent of their total expenditure on health.

For the nine villages on aggregate, the number of villagers living below the poverty line is about 38 percent. There are vast differences across villages, however. In poorly endowed and low productivity villages like Trapeang Prey and Dang Kdar, the percentage of poor villagers is well above 60, while in better endowed and high productivity villages like Prek Kmeng, Babaong and Kompong Thnaot, less than a quarter live below the poverty line. Patterns in the extent of poverty are similar. Analysis in this chapter very much supports the finding earlier in this paper, that incomes from resource-based employment and poverty are inversely related.

Compared to 1996–97, when three of the villages were surveyed by CDRI, there has been considerable progress in two and the poor have reduced by large proportions. In the third village, which is poorly endowed and has large proportions living below the poverty line, the situation has worsened. Few, however, can be termed either ‘very poor’ or ‘rich’ in rural areas.

Chapter Eight

Labour Markets

Analysis suggests that rural people engage in a range of activities to pursue a survival strategy. In some, the work is in self-employment while for others, it is wage labour. There is a functioning labour market with males, females, and at times children, participating in it either for cash, or some other reciprocal payment. The conventional wisdom, which suggests that rural Cambodians do little else than subsistence paddy cultivation, seems to be questioned by these statements. In the context of rural livelihood strategies, it is therefore pertinent to ask the following questions:

1) What is the extent of self-employment and wage employment that workers participate in, including children?
2) What are the gender differences in different activities that people undertake?
3) What are the wages that different workers earn — are they living wages?
4) What is the diversity in wage-based activity, particularly through migration?

8.1. Labour Force Participation and Child Labour

Table 8.1 reports labour participation rates of persons by gender and age in the nine villages. Child labour in the age group 7–12 years is a little over 8 percent. Among children aged 7-12 years, only about 55 percent are in schools, with no significant difference between sexes. Among those who are students, 52 percent of the males and 43 percent of the females are also engaged in work. Child labour is therefore a significant factor.

The 13–17 year age group also has a high incidence of child labour: 43.5 percent of males and 52.8 percent of females are out of school and in the labour force. The gap between the sexes is due to the lower enrolment rate of 41.6 percent among females compared to 49.3 percent among males. A majority of those who continued their studies also worked, again suggesting a prevalence of child labour.

In the 18–24 year age group, only 7.4 percent of males and 3.5 percent of females continue to study. All the 3.5 percent of females who study also work, compared with 73 percent of the 7.4 percent males.

In the higher age groups, labour force participation becomes steadily higher, among both men and women. These data, typical to any low-income country, suggest that people's enrolment rates are generally low, and people enter the workforce rather early.

Table 8.1. Economically Active and Economically Inactive Population by Age and Sex

Age	Sex	Economically active	Student*	Disabled	Too young or too old to work	Total
7 – 12	Male	8.4	55.3 (52)	0.2	36.1	100
	Female	8.1	55.5 (43)	0.4	36.0	100
13 – 17	Male	43.5	49.3 (83)	1.3	5.8	100
	Female	52.8	41.6 (76)	1.1	4.5	100
18 – 24	Male	91.8	7.4 (73)	0.8		100
	Female	95.1	3.5 (100)	0.3		100
25 – 34	Male	98.1		1.6		100
	Female	98.8		1.2		100
35 – 44	Male	99.7		0.3		100
	Female	98.5		1.2		100
45 – 54	Male	96.9		2.5		100
	Female	96.0		1.8	2.2	100
55 and over	Male	66.8		4.1	28.5	100
	Female	48.5		3.0	47.8	100

** Figures in parentheses indicate the percentage of students who also work.*

8.2. Self Employment in Agriculture

Table 8.2 exhibits the time allocation of male and female workers in farming their own land. The average number of hours worked each day on activities on their own farms is slightly more for males (6.3 hours) than for females (6.1 hours). Villagers in the agriculturally most productive villages, such as Krasaing and Babaong, spend longer hours in farming their own land than farmers in other villages. However, the hours worked have been quite inaccurately reported by the respondents since most found the concept alien to them.

Table 8.2. Hours and Months of Engagement in Agricultural Work on Villagers' Own Farms, Ages 15–54

	Number of hours per day			Number of months per year		
	Male	Female	Total	Male	Female	Total
Tonle Sap						
Andong Trach	4.7	3.3	4.1	4.4	4.6	4.5
Krasaing	8.2	7.8	8.0	3.7	4.0	3.9
Khsach Chiros	6.1	6.1	6.1	5.9	5.8	5.9
Mekong Plain						
Prek Kmeng	5.8	5.6	5.7	3.4	3.2	3.3
Babaong	7.6	8.1	7.9	4.7	4.2	4.5
Plateau						
Kanhchor	5.5	5.6	5.6	3.9	3.3	3.6
Dang Kdar	7.0	6.8	6.9	3.9	3.9	3.9
Trapeang Prey	5.9	6.4	6.1	6.8	6.4	6.6
Coastal						
Kompong Thnaot	4.9	5.2	5.0	6.3	6.2	6.2
All villages	**6.3**	**6.1**	**6.2**	**4.7**	**4.6**	**4.7**

Note: The upper age ceiling is fixed at 54 years.

Agriculture, mainly rice cultivation, does not occupy the villagers for the whole year. On average, farmers are engaged on their own farms for only about four or five months each year. This is the average duration of the rice crop and both male and female farmers are engaged for about the same period.

These data support the income data, generated in earlier chapters, and reaffirm that farmers do not work in agriculture all the time, nor do they get all their income from agriculture.

8.3. Cash Earning Jobs

The daily earnings of those engaged in paid jobs, by category of work, location, and gender was surveyed over both rounds of the wet and dry season (Appendix 7, Table 1). In most cases, a worker does not earn much more than 4,000 riels (about $1 dollar) a day. In all categories of work, a male worker earns more than a female worker does, though their activities are not necessarily the same.[54] Wage rates for working in the person's own village are lower than for work outside. On average, a male worker earns about 3,500 riels a day for agricultural work in his own village, but gets 4,500 riels in other villages. The higher wage partly compensates the costs and inconvenience caused by working at another location.

Comparison of wage rates between villages or between occupations does not make much sense because the work organisation in each village is different, the labour market is variable, and the type of work differs significantly. The wage rate for agricultural work in Andong Trach village, for example, is 6,400 riels a day, but this is an average amount paid to two workers. Differences in the labour market can be illustrated by Kompong Thnaot where the wage rate was reported as 7,000 riels a day for agricultural work in the wet season survey, but only one worker is reported to have worked for a wage. With respect to the varied nature of work undertaken, workers from Kanhchor received the highest daily earning (at 8,389 riels for the wet season survey — Round 2); but this was off-village work, the main work being sowing, and transporting timber from the forest.

In the fishing villages, paid labourers in Khsach Chiros earn the least. In the dry season, for 2001, a male worker earned only about 2,500 riels a day in Khsach Chiros compared to 4,400 riels in Prek Kmeng and 4,000 riels in Kompong Thnaot. This partly illustrates why Khsach Chiros is among the poorest villages. In the wet season, cash income from fishing dropped in the two inland fishing villages but rose in the coastal fishing village. Female anglers reportedly earned much less than their male counterparts.

Collecting non-fish aquatic resources does not yield as much cash income as the activities described above. In Krasaing and Prek Kmeng (the villages that have the largest number of residents engaged in this activity), a male worker earned 3,500 riels or less each day, though female workers earned even less income from this activity. Gathering forest resources also does not generate much cash income except in Kanhchor where villagers undertake heavy work on timber processing.

In summary, it is illustrated by the data that wages are not high in any of the known rural jobs with few earning more than a dollar a day.

Table 8.3 shows the daily earnings in different jobs by the educational level of workers. For most jobs, the illiterate earn lower daily wages than the literate. For agricultural work within the village, the literate earned a few hundred riels a day more than the illiterate did. For both men and women, the higher the education of the workers, the higher the earnings they receive; women's wages, though, are consistently lower than that of men's for all levels of education. Education, however, does not seem to make a significant difference in the earnings from fishing. For the rest of the occupations, there are some distinctions between earnings by education levels. Data in this table suggest that despite the largely manual-labour nature of work in rural areas, education still matters in wage determination.

[54] For instance, in agricultural work, a male worker who prepares the land using a pair of draught animals is paid twice the amount of a female worker who transplants.

Table 8.3. Wages/Earnings by Educational Level, Job and Gender (thousand riels per day)

	Illiterate			Some education			Secondary and above		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
				Round 1 (Dry Season)					
Agric. work in village	2.1	2.5	2.4	2.7	2.9	2.8	2.5	2.5	2.5
Off village work	4.4	3.1	3.7	5.5	3.0	4.7	6.4	3.9	5.7
Work in Thailand	7.1	6.7	6.9	6.4	9.0	7.1	6.7	-	6.7
Small trade/business	3.9	3.2	3.2	3.3	3.5	3.5	5.2	2.7	3.7
Palm sugar production	5.3	0.5	4.3	6.7	-	6.7	4.6	7.0	4.9
Fishing	4.1	2.0	3.5	4.0	2.4	3.7	3.9	3.0	3.8
Collect other aquatic resources	2.6	2.4	2.4	3.6	2.3	2.7	2.8	1.7	2.3
Collect forest resources	2.8	1.4	2.2	3.3	1.4	2.6	3.1	1.1	2.5
Other work	7.7	4.5	5.4	3.3	4.8	4.0	7.4	3.1	6.3
Total	**4.4**	**2.9**	**3.8**	**4.3**	**3.3**	**4.2**	**4.7**	**2.7**	**4.2**
				Round 2 (Wet Season)					
Agricultural work in village	3.1	3.0	3.0	3.2	2.9	3.0	3.4	2.4	3.0
Off village work	3.5	4.1	3.8	6.1	3.2	5.2	7.6	4.3	6.7
Work in Thailand	5.5	6.2	5.9	6.5	4.9	6.0	7.1	7.0	7.1
Small trade/business	3.0	2.4	2.4	4.7	2.4	2.7	4.1	2.4	3.0
Palm sugar production	5.9	-	5.9	4.6	-	4.6	3.9	-	3.9
Fishing	3.1	2.0	2.7	3.4	2.2	3.1	3.5	3.2	3.5
Collect other aquatic resources	3.9	2.5	2.6	3.0	2.2	2.4	2.5	1.8	2.2
Collect forest resources	4.3	1.8	3.2	5.6	1.5	5.0	6.2	2.3	5.4
Other	3.6	3.5	3.5	4.2	3.1	3.9	4.3	2.1	3.7
Total	**4.0**	**2.8**	**3.7**	**4.6**	**2.5**	**4.0**	**4.8**	**2.8**	**4.3**

8.4. Labour Migration to Thailand

Cross-border labour migration is on the increase with regional integration. Attracted by the boom in the Thai economy before the 1997 financial crisis, a large number of Cambodian workers entered Thailand to seek work, both in Bangkok and in the provinces bordering Cambodia (Chan and So 1999). Despite the slowdown of the Thai economy, the lack of employment diversification in Cambodia that could soak up an increasing labour force, results in many Cambodian workers migrating to Thailand.

The present survey found that 110 households in Krasaing, or 48 percent of the total households, each sent at least one member to work in Thailand (Table 8.4). In 2001, 95 male workers travelled to work in Thailand. This equals 30 percent of the men aged 15–54 years in the village. They earned an average daily wage of 6,650 riels. Fifty-three women (or 17 percent of women aged 15–54 years) migrated to Thailand. They earned a lower wage rate, of 5,800 riels a day.

Despite being located near Krasaing, Andong Trach only has twelve male and five females working in Thailand. Contacts and familiarity with labour markets largely facilitates international migration. Krasaing has been able to establish such links overtime, whereas Andong Trach, a refugee-resettlement village, has yet to do so.

Job opportunities in Thailand are available year round, though the demand is slightly higher in the wet season compared to the dry season. Most of the jobs Cambodian migrants undertake are in farming, transplanting, weeding and harvesting. The migrants are mostly illegal and stay in Thailand for an average three to four weeks for each journey.

Table 8.4. Number of Migrants to Thailand and Wage Rates

Village	Number of Households (percent of total households)	Number of Migrants (Percent of age group (15–54))			Wage (riels/day)		
		Male	Female	Both Sexes	Male	Female	Both Sexes
Krasaing	110 (48 %)	95 (30%)	53 (17%)	148 (23%)	6,650	5,800	6,300
Andong Trach	14 (7%)	12 (4%)	5 (2%)	17 (3%)	7,330	9,000	7,750

8.5. Summary

Child labour is significant. Many children who are in school also participate in work. Work on family farms does not employ people for more than five months on average. Both men and women spend about equal time on family farms (about six hours each day). This is a slack time for many, since work on their own farms does not take up all the time of the farmers. Wage earnings of male workers are an average 15 percent higher than that of female workers, although the types of work undertaken by male and female workers differs. Daily wages across the villages are mostly between 3,000–5,000 riels. Wages earned by migrant workers in Thailand are about 6,000–7,000 riels a day. In select sectors, workers having secondary level education or above, earn about a fifth more than those having very basic education, while in turn those with very basic education, earned about 15 percent more than the illiterate.

In the context of food security, work for a wage is assuming increasing importance. Yet, almost all the work that Cambodian workers carry out is of the manual and unskilled type. Wages are low and barely sufficient to maintain livelihoods. The present trends suggest that with larger numbers engaged in wage labour, the average household earnings will drop. This is a cause of concern.

Chapter Nine

Crises, Responses and External Assistance

In recent years, Cambodian farmers have been seriously affected by natural disasters, mainly floods and droughts. In the year 2000, Cambodia experienced severe flooding, considered the worst in the past four decades. The damage was estimated at $157 million and 347 lives were lost. In 2001, there was more flooding, causing damage worth an estimated $36 million. The disaster situation continued in 2002 when twin crises hit the country: a drought, the worst in recorded history, and flooding in the Mekong Plains.[55] Given the periodicity of disasters, it appears as if Cambodia will have to face floods and droughts regularly in the future.

These disasters affect farmers the most, reducing their food security and increasing their poverty. People also face other setbacks each year as part of their life. These could include disease, premature death of family members and/or animals, crop failures due to pest attacks, theft and sudden loss of jobs or livelihood. In the absence of any social insurance or other support system, disasters can cripple livelihoods. Recurrent disasters turn normally non-poor households into those vulnerable to poverty and can make poor households even poorer. This chapter examines this vulnerability, *i.e.* the nature, extent and impact of crises faced by the rural communities, and their response to them. It attempts to address the following questions.

1) What is the incidence and magnitude of these crises felt at the household level?
2) How significant is each type of crisis to the households in terms of monetary loss?
3) What are the responses to crises by the affected households?
4) What external assistance was provided to households in different villages and to different income groups to help alleviate the problem?

9.1. Prevalence of Crises and Monetary Losses

One crisis or another affected almost every household in all the sample villages, except Trapeang Prey, during the period under reference (Table 9.1). On average, 90 percent of the households (almost 100 percent in Khsach Chiros, Prek Kmeng, and Dang Kdar) were subject to one or more crises. Trapeang Prey, the smallest village in the sample, was the least affected: only 22 of the 68 households in this village reported that they were affected by some setback. The floods do not affect Trapeang Prey as it is located in the highland area

In Krasaing, Khsach Chiros, and Dang Kdar, the total monetary loss for each affected household was more than 1 million riels over one year. This loss is equivalent to about 40–60 percent of a household's total annual income. The average loss per household in the nine-

[55] Declaration of the Disaster Situation in the Year 2002, signed by the Prime Minister, Hun Sen.

village sample was 913,000 riels: one third of their total annual income. Households in the Coastal and Mekong regions, however, did not suffer as heavily as households in other areas.

Table 9.1. Prevalence and Magnitude of Crises, 2000–01

	Percentage of households affected by crises	Monetary loss per household (Thousand riels per year)	Total income per household (Thousand riels per year)	Loss as proportion of household income (%)
Tonle Sap				
Andong Trach	92	770	2,662	29
Krasaing	96	1,481	3,582	41
Khsach Chiros	99	1,295	2,023	64
Mekong Plain				
Prek Kmeng	99	870	3,633	24
Babaong	95	719	3,311	22
Plateau				
Kanhchor	93	701	1,831	38
Dang Kdar	99	1,016	1,383	73
Trapeang Prey	32	313	1,652	19
Coastal				
Kompong Thnaot	83	438	3,387	13
All villages	**90**	**913**	**2,750**	**33**

Crises caused by illness are all pervasive. In the nine villages, 64 percent of the total households reported that they had serious health problems. Villagers in Krasaing reported the highest incidence (88 percent), followed by those in Babaong, Kanhchor and Dang Kdar (Appendix 8, Table 1). Both poorer and better off villages have health problems, indicating the magnitude of illness prevalent in rural Cambodia. Expenditure on illness does not vary greatly across villages and households: the average expenditure is 376,000 riels for each affected household per year.

The village most severely affected by crop failure due to pest attacks in 2000–01 was Khsach Chiros where 77 percent of the households were affected and each lost an average of 297,000 riels in that year. Dang Kdar was next, where 55 percent of households reported that their crop failed due to pest attacks. The damage was equivalent to 39,000 riels for each affected household. Villages least affected by pests were Krasaing, Babaong, Trapeang Prey and Kompong Thnaot.

Forty three percent of the households reported that floods affected them in 2000 and 2001. Floods hit all the villages in the Tonle Sap and Mekong regions. In terms of proportions of households affected, Andong Trach and Khsach Chiros lost far more than any other village with respect to crops damaged by flood. However, the loss (in monetary terms) was by far the highest in Krasaing where on average, the combined loss for both, the wet season rice in 2000 and late dry season rice in 2001 was 1,783,000 riels for each affected household. Households with larger farms were hit the hardest by the two consecutive year's disasters.

Apart from washing out the crop, floods caused other damage as well. They destroyed dozens of houses and other property. Eighty-five percent of the households in Prek Kmeng were affected like this. On average, an affected household lost about 438,000 riels. Another regularly flooded village, Khsach Chiros, was hit hard, though there were fewer households affected and the monetary losses were lower compared to Prek Kmeng. While only 5 percent of the households in Krasaing reported damage to property, the loss was severe, averaging 2 million riels for each affected household.

Cattle and pigs are important assets in rural households. When a cow dies of a disease or is stolen, the household economy is disturbed. Instances of theft or loss of animals affected

almost half the households in Andong Trach, Khsach Chiros, Babaong and Dang Kdar . The loss incurred by an affected household was in the range of 200,000–300,000 riels over the year.

About a quarter of the households in Prek Kmeng, Kanhchor and Dang Kdar reported instances of robbery or theft. By contrast, Krasaing, Babaong and Trapeang Prey were almost free of these kinds of problems.

Finally, some households faced sudden job loss or business closure. Seventy percent of the households in Dang Kdar reported such instances, including the loss of jobs in timber concessions. (An average household in Dang Kdar could probably earn about 800,000 riels per year from timber harvesting).

Table 9.2 shows the distribution of households by income groups and the type of crises faced. The crises affected almost everyone. The better off households lost more in terms of monetary value than those less well off, which is natural as the better off possess more wealth. The poor, however, lost more when losses are seen as a proportion of income. In the poorest income quintile, the crises resulted in losses equivalent to about 50 percent of people's total household income, in the second poorest quintile the losses were 40 percent of the income, while households in the better off quintiles lost amounts worth about 30 percent of their income.

Table 9.2. Prevalence and Cost of Crises in One Year (by income quintiles)

Quintile by income per adult unit by village	Any crisis/ total	Death of family member	Health crisis	Crop failure due to pests	Crop damage by flood	Other damage by flood	Animals died or stolen	Theft, robbery or deceived	Other crisis
	(Percentage of households facing crises)								
1st 20% (Poorest)	88	7	63	21	39	24	24	9	14
2nd 20%	92	9	68	20	42	22	37	11	17
3rd 20%	91	5	61	24	43	24	31	9	16
4th 20%	93	5	60	28	49	24	33	13	17
5th 20% (Richest)	89	10	66	25	42	21	36	15	18
	(Average monetary losses, thousand riels/affected household)								
1st 20% (Poorest)	591	233	271	153	323	171	230	142	433
2nd 20%	781	531	339	125	365	308	134	570	465
3rd 20%	766	292	363	141	471	273	224	129	482
4th 20%	973	764	386	200	623	209	258	290	602
5th 20% (Richest)	1,464	1,218	518	253	761	716	296	342	877

9.2. Response to Crises

How do households respond to crises? Different households choose different strategies, depending upon their ability to draw upon resources that they have accumulated. The most common response was to use up savings and/or reduce consumption, with dipping into savings being reported by 68 percent of the affected households (Appendix 8, Table 2). The proportion of households that could use up savings was higher among the better off villages, such as Prek Kmeng, Babaong and Kompong Thnaot. In contrast, the number of households that reduced consumption was higher in Krasaing, Khsach Chiros, Kanhchor, and Dang Kdar, where people had been able to save smaller amounts.

It is also popular with households to raise loans (with or without interest) in response to crises. About 50 percent of the households facing crises raised loans to mitigate the crisis.

Those households who also owned animals used the option to sell them. Households in Andong Trach, Dang Kdar, and Trapeang Prey sold more animals than households in other villages. Selling agricultural land or residential land is the last resort as land is considered a major asset. Nonetheless, a few of the households that were affected by the crises sold agricultural land. A major resource is labour, of both adults and children. In villages where migration for work forms a major part of livelihoods (Krasaing and Trapeang Prey), quite a few households migrated to seek work outside the village. Many also resorted to sending their children to work for others in order to alleviate the adverse impact of the crises.

The poor and non-poor households embark upon different strategies to cope with crises. As shown in Table 9.3, the better off households are more likely to dip into savings since they have some reserve. In contrast, the poor tend to reduce consumption, as this is one among their fewer options. About 60 percent of the households in the highest income group also responded by decreasing consumption, though the items of consumption that the rich cut could be different from those of the poor. Nevertheless, these statistics show that the rural rich are not truly rich; they also are vulnerable as was indicated in Chapter 7.

Fewer among the better off (compared to the poor) responded to the crises by contracting loans. The better off prefer to sell animals instead. On the other hand, the poor, who own fewer animals, depend relatively more on hiring out labour, including that of their children.

Table 9.3. Responses to Crises by Income Quintiles (distribution of households)

Quintile by income per adult unit by village	Used savings	Reduced consumption	Took loans	Sold animals	Sold agricultural land	Household members migrated to find work	Children to work for others
	(Percentage of households facing crises)						
1st 20% (Poorest)	56	75	54	2	3	12	6
2nd 20%	61	66	58	6	2	11	6
3rd 20%	70	70	52	5	3	9	4
4th 20%	78	68	52	8	1	8	3
5th 20% (Richest)	75	60	33	18	2	7	3

9.3. External Assistance to Alleviate Crises

Besides their own means, households may also rely on external assistance to cope with crises especially when their resources are exhausted. In present day Cambodia, inter-dependence of households remains strong and family/kinship relationships are relied upon in times of crises (McAndrew 1998). Next, in the face of severe crises such as floods and droughts, both NGOs and government agencies play an important role in alleviating the problems faced. Specific data indicates that responses from the government were the strongest followed by that from NGOs, and then friends and relatives (Appendix 8, Table 3).

Table 9.4 presents the distribution of households by income groups and assistance received for mitigating crises. Both government assistance and NGO help was more 'area-specific' rather than income-group specific. The poor as well as the non-poor gained almost equally, seeming to confirm that there was no household-specific targeting of aid.

Table 9.4. Prevalence of External Assistance

Quintile by income per adult unit by village	Assistance from relatives/friends	Assistance from NGOs	Assistance from government
	(Percentage of households facing crises)		
1st 20% (Poorest)	18	18	38
2nd 20%	14	17	41
3rd 20%	8	14	41
4th 20%	9	16	37
5th 20% (Richest)	12	17	32

9.4. Summary

Facing crises, whether natural or man-made, has become almost a way of life in most villages. In addition to the regular health, crop failure, and security-related problems, the extraordinary floods in 2000 and 2001 increased the financial problems in villages located in the Tonle Sap and Mekong regions. The non-poor suffered greater monetary loss than the poor did, but the poor paid a higher price in proportion to their income. The types of responses to crises differ considerably across villages and households. Most affected households responded to crises by dipping into savings and/or reducing their consumption. Among the less exercised choices were, contracting loans, selling land and migration. Relief assistance from NGOs and government agencies was provided to a number of households in the villages that were hit by the floods. Aid was neutral across income groups — it has not been targeted only at the poor.

Seen in the context of food security, the poor are highly vulnerable in the face of both natural disasters and personal problems. In the absence of any social security, many end up parting with their means of livelihood, making them more vulnerable than previously.

Chapter Ten

Conclusion

This paper presents the findings of a field survey carried out in nine villages spread across the four broad agro-climatic zones in the country to assess the nature and extent of food security in Cambodian villages. The findings of this study are based on a questionnaire-based inquiry of 1,005 households in nine villages, in addition to a village questionnaire. The survey was conducted in two rounds (wet and dry season) to capture the seasonality in food security.

This survey of nine villages is a sequel to an earlier study carried out by CDRI in three villages, which have been resurveyed here. This has permitted some limited comparison with the earlier study.

This is a diagnostic study; it is not a blueprint for a policy prescription on rural development. Therefore, after presenting a short summary of the findings, this chapter presents a concise understanding of the current trends in socio-economic development in rural Cambodia. A short prescriptive statement given at the end of this chapter is more by way of general observation rather than a firm statement on policy direction.

10.1. General Findings

The broad findings from the field survey are presented first, to provide a concise view of the analysis presented in Chapters 3–9:

1) Land and other natural resources form the principal source of village livelihoods in rural areas. Those farmers who do not own agricultural land, or who have little access to other natural resources, face chronic or seasonal poverty and food insecurity. Agricultural landlessness is high: about 20 percent of rural households do not own any land, though not all of them are farmers. Additionally, another 25 percent own land plots of sizes less than 0.5 hectare, which are insufficient to sustain livelihoods. Consequently, more than 40 percent of rural households constitute the 'landless and near-landless category.'

2) Land frontiers are not expanding at the same pace as the population; consequently, the amount of land available per person is becoming lower overtime. This is an important reason for people to become landless or near landless. Next, land markets are quite active and there is a rapid transfer of lands, particularly those plots that are productive. This is another reason for people to become landless. Estimates suggest that landlessness is presently rising at a rate of 2 percent each year.

3) Farm yield rates are still quite low in Cambodia. Smaller farms are more productive in the low-input wet season crop, though smaller farms are not necessarily more productive in the high-input dry season crop. In either of the seasons, smaller farms yield lower

incomes and result in lower food stocks with families. With farm sizes becoming smaller but productivity not expanding fast enough, farmers' incomes are low. In fact, incomes are so low that some farmers are unable to meet pressing expenses, particularly on illness, and in a few cases, they are compelled to sell their land. Despite this syndrome, lands are still being atomised as the population is rising rapidly and occupations, particularly in rural areas, are not expanding fast enough.

4) The landless earn their incomes principally from wage labour. However, since wages are low (at subsistence) earnings are insufficient to ensure food security for these households.

5) As with any agriculture-based society, villagers in rural Cambodia need credit on a regular basis, for production as well as consumption purposes. Lack of funds and supply side rigidities in institutional credit make people go to private moneylenders, from whom credit is expensive. The high cost of money reduces the net disposable incomes of households, affecting food security.

6) Most rural Cambodians earn their living from multiple sources: the principal ones are agriculture, common property resources (mainly from forests and fishing), and wage labour. On average, agriculture provides only about a third of total income, though the regional variations are large. In recent years, the proportion of income derived from agriculture is rising (particularly in the resurveyed villages where time-based comparisons could be made), while incomes from CPR are not necessarily rising at the same pace. The poor face food insecurity since they derive more income from CPR and less from agriculture, and returns from wage labour (to which they resort) are not as high.

7) Using quite rigid definitions, the 1998 Census concludes that wage labour in rural areas is virtually non-existent. In contrast, this survey (and the earlier CDRI survey conducted in 1996–97) indicates that large numbers of people derive incomes from wage labour and the aggregate share of incomes from this source could be as high as 17 percent. However, the wage rate is low and the average does not exceed 4,000 riels a day. The range could be 3,000–5,000 riels depending on the location of work, and whether the worker is male or female.

8) The rich and poor consume almost the same quantity of rice across all seasons. There is, however, a wide variation in the consumption of non-rice food items as well as non-food items. Food security is thereby defined as consumption of a certain quantity of rice. According to this survey of nine villages, the number of people subsisting below the poverty line is about 38 percent. This is similar to levels revealed by the SES of 1997 and 1999. Not many are very rich or very poor in rural areas. Even the rich face reductions in consumption of some items in the lean seasons, while the poor are able to maintain a certain quantity of rice consumption.

9) People face uncertainties originating from natural disasters. The average loss could be as high as about a third of annual income. As a proportion of income, the poor face more losses than the rich do. Mitigation approaches are area specific and neutral to the socio-economic status of the households.

This survey produces the following data that could correct some popularly held notions about the Cambodian agrarian situation.

- Somewhat contrary to the suggestions contained in the census report, wage labour is extensive. Increasing numbers now rely upon labour, and while most workers may not work for most of the year for wages (maybe why they get missed out in large surveys), large numbers work for a part of the year as labourers.
- It would be incorrect to say that rural Cambodians do little other than growing rice. In fact, rice cultivation and general crop activity, engages villagers for no

more than an average four or five months. For the rest of the time they forage, fish and gather — a range of food and non-food items, that often misses enumeration in large surveys. In addition, they are undertaking small business activity and wage labour. Accordingly, average income from agriculture does not exceed 30 percent of total income; the rest comes from non-farming sources. Policies to privatise commons or even restrict access to some of them (for conservation purposes), could hit rural livelihoods.

- The small farm is a norm of the previous era; it is neither efficient under modern agricultural practices, nor able to provide livelihoods and food security to the farmers. Small farmers are losing their land, as they are not able to hold on to uneconomically small land plots.
- The survey data shows that moneylenders are still the most dominant source of credit. This is not only because credit supply from institutional sources is limited, but also because the nature of credit demand in an agrarian set up is quite different to that which the formal banking system tends to believe. Villagers make little distinction between credit obtained for production, investment, consumption or rituals, while suppliers like to extend credit only for productive and investment purposes.
- The actual inequalities in land and consumption, suggest it would be hasty to conclude that some villagers are poor because some others are rich. The gap between the 'poor' and the 'non-poor' is not very large (unlike some other Asian economies).
- The frequency of crises suffered by the agricultural community is large, and the damage to the affected families can be a large proportion of their annual total income. Recurrent crises increase the vulnerability of a large section of the rural population.
- Poor health conditions are a result of poverty, low nutrition, and an unhealthy environment (*e.g.* drinking water). Poor availability of preventive and curative services is the reason for villagers to seek expensive private medical services, which lands them in debt.

10.2. Understanding the Cambodian Rural Economy

Which direction is the Cambodian rural economy moving in? Do the data and analysis in this paper provide answers to this question? It is well known that Cambodian agriculture originated from *extensive* origins, in which the population dependent on land and other natural resources was always small. Consequently, despite low productivity, there was sufficient food (Acharya and Chan 2001). Even until the mid twentieth-century, the population was less than 4 million (compared to about 11 million in 1998).

With increasing commercialisation of the rural economy and its exposure to the larger markets for most of the twentieth-century — *without any significant effort to alter the structure of supply or organisation of production within the rural economy* — the system is facing increased strain. There are now many claims on the forest, water, fish, and land resources from outside the agrarian sector. To make matters worse, the population is rising rapidly and demands on resources from within the rural economy are rapidly increasing. With demand increasingly exceeding the supply, less and less resources of the traditional type (*i.e.* land, forest and fish) are available for rural people per capita. Consequently, a new category of landless farm labourers is now very quickly emerging.[56]

[56] The island of Java faced a similar experience in the 1960–80s. Large numbers becoming employed in labour-intensive industries partly eased the problem.

It is not that the quality of life is deteriorating for everyone in rural areas. In several areas, agriculture is being modernised and high yield variety seeds, fertilisers and controlled irrigation are finding increasing acceptability. This 'green revolution' is particularly successful in areas possessing better quality soils and easily accessible water resources. In these areas, farmers' incomes are rising, and agriculture is steadily becoming the dominant source of livelihood. In some other areas, resources like fish are still plentiful (or fish availability is increasing with the introduction of fish culture), and incomes from this sector are rising. Consequently, incomes are increasing in areas wherever resources are growing (or being developed). Those who own the resources definitely gain, though at this stage it is not clear how strong the multiplier effect of this increased income is. It is also uncertain whether in turn, this will distribute gains to those who do not own resources, through employment.

In some other areas, however, resources are shrinking — or at the least they are not growing. In these areas, there are already natural limitations such as poor rainfall and limited water bodies, and the weight of an increasing demand is taking its toll. As villagers' incomes from traditional sources are reducing, they are increasingly taking up wage labour. Returns from labour, however, are lower than the returns from productive physical resources (*e.g.* agriculture or fish), and the wage rates are lower than even a dollar a day. Additionally, growth in non-agricultural employment is rather slow and uneven across the country. In this transfer of occupations which is taking place in all locales — whether deficit or otherwise — some people's incomes are reducing (due to both low wages and less work). Consequently, the aggregate poverty rate is not reducing at paces that would be commensurate with other macroeconomic variables, such as GDP growth. To compensate for low incomes, increasing numbers particularly from the border areas, either travel to Thailand where wages can be higher, or migrate to urban areas in the hope of earning a better living. Neither of these is easy to achieve, especially cross-border migration, which is not a sustainable solution.

Agriculture is not expanding fast enough and current land yields in Cambodia are the lowest in all of Southeast Asia. Among the reasons are credit constraints, inadequately controlled irrigation, insufficient market linkages, and poor quality infrastructure (both physical and social). Additionally, rural non-farm activities are not growing for similar reasons. A slow growing rural economy is naturally unable to effectively support increasing numbers joining the labour force each year, which is by itself a reason for growing food insecurity.

Returns from labour are low for at least three reasons. First, the non-farm sector is not growing fast enough in either rural or urban areas. Wherever it is growing, such as in the garment sector, construction and tourism, there is insufficient job growth. Second, the nature and composition of economic growth is such that it has few links to rural areas. On the production side, there are virtually none (*i.e.* the value added by production is shallow), though in terms of repatriation of earnings, both regular and migrant workers send money back. However, these amounts are small and shrinking, especially as the garment industry is not growing at the pace it was previously growing. Compared to, for example, Thailand in the 1970–80s and China in the 1990s, the rural linkage of growth in Cambodia is rather small. Third, investment in human capital is low in Cambodia, particularly in rural areas. For most skilled jobs, therefore, foreign labour is employed and the transfer of skills is low. Many jobs do not require purely unskilled labour and this closes many segments of the labour market to rural youth.

As stated previously, farmers still derive incomes from multiple sources. With a few sources of income becoming less available (*e.g.* forest and fisheries), some villager's incomes could fall. On the other hand, if full access to commons is permitted, the commons could rapidly deplete under the new market integration system, as was seen for some time in the

1990s.[57] It is not clear whether the new 'community-based' management of resources, which has been proposed by the government and donors alike, will find a solution to this problem. Surely, there is no simple way out, unless there are significant alterations made in a system that was initially meant to support much smaller numbers and meet much smaller demands. These alterations should be in the direction of strengthening agriculture and other renewable resources, in addition to creating more livelihood options.

What can be said about the overall food security situation? There is no denying that food production has been rising gradually but steadily, and will continue to grow in the near future especially with larger number of farmers embracing modern variety seeds and fertilisers, and harnessing some water for irrigation. Additionally, some crop diversification is taking place. There is also some export of food items, which can be expected to grow. Each of these achievements, however, can only improve the food security of the deficit farmers and villagers in a limited way. Much of the distribution of gains will depend on whether, and to what extent, both wage and labour opportunities grow, not only in agriculture but in other activities as well.

10.3. Policy Options

This paper discusses results of a diagnostic study, and there is no intention to draw definitive policy implications from the study. Nonetheless, some general observations and statements deserve mention.

10.3.1 Agricultural Land Rationalisation

The first step is to rationalise agricultural land holdings, the principal source of livelihood in rural Cambodia. This is possible within the agricultural development programmes currently being implemented by the government. A lower ceiling on the size of land holdings and putting an end to excessive land fragmentation should form a vital component of this programme. In fact, experiences of a number of countries in the implementation of land reforms in Asia (as elsewhere) can be examined with critical elements that relate to optimal land size, and incorporated in the land reform programme.

Next, landlessness will have to be addressed. Cambodia has some surplus lands, estimates of which have been made in Chan, Tep and Acharya (2002). To an extent, these could be redistributed to reduce or even eliminate the present landlessness on a one-off basis. The issue of landlessness cannot be addressed through land redistribution alone however. This is because landless families are also as much a part of the larger community as others and it is not feasible to relocate people to where the surplus land is.

10.3.2 Infrastructure Development

Also of concern is the lack of infrastructure in locales where surplus land is located. Not all locales are habitable unless a minimum infrastructure is established. In this context, non-land based occupations require promotion in locations where the landless are presently located. Rural industries, agro-processing activities, and other off-farm vocations in fishing and fish processing are some promising options. Perhaps it needs mention that in addition to access to resources by ordinary farmers on the one hand and scientific management of the stock on the other, raising unit productivity and creating a higher value added, is of equal importance.

10.3.3. Agricultural Modernisation

Improving land productivity and profitability from agricultural operations is paramount. In other words, effort should be made to modernise agriculture and make land use more

[57] In fact, the World Bank had cautioned against rampant deforestation in a report it had brought out in the late 1990s.

intensive. To achieve this, application of high yielding seed varieties, fertilisers, and pesticides all in the presence of controlled irrigation are some important prerequisites. The whole focus of agricultural modernisation should be to plot a trajectory away from subsistence towards market orientation through strengthened supply.

10.3.4. Development of Credit Societies

The credit needs of villagers are closely linked to the peasant way of life. Yet, the micro credit institutions in Cambodia typically conduct banking operations in a conventional textbook style. Perhaps what is missing is the intermediate step of setting up community-based credit societies, which accept deposits from members as well as banks, and lend money to members of the society as per their demand. The societies continuously lend money to the clients for a price and collect dues from them. Since the credit cycle is fairly short, even small amounts of money can generate huge advantage. This is a successful model in some countries. In Cambodia, Commune Councils could catalyse the establishment and activation of credit societies.

10.3.5. Natural Resource Management

CPR is an important source of livelihoods. Management of CPR is already a priority of the government. What could perhaps be emphasised from this study are both the extent of dependence on CPR and the span of products that CPR provides. These aspects could then find place in policy.

10.3.6. Poverty Reduction

Poverty is a cause for concern. It is not difficult to envision that many in rural areas will still be poor even after a proper land reform and agricultural modernisation is undertaken. Global experience suggests that in addition to sectoral approaches to poverty alleviation, specific target group approaches are equally as important. The government is presently in the process of formulating its Poverty Reduction Strategy. This is a high priority programme. From this study, it is possible to suggest processes that have direct link to poverty in rural areas. Findings of this study could be followed up, particularly with respect to:

(a) The landless and near landless

(b) Dependence of farmers on non-farm incomes

(c) Squeeze in non-farm incomes

(d) Functioning of land, labour and capital markets.

10.3.7. Disaster Management

Since natural disasters are so frequent, a long-term policy of flood control, water management, irrigation, and energy production is required, though this must be weighed against the potential impacts to Cambodias extensive fisheries. Additionally, as there is no social insurance other than *ad hoc* aid available from NGOs and the government, it is imperative to put in place some systems that could absorb crises arising from natural disasters. In some developing countries, crop-insurance exists, minimum support schemes are in place, and in some countries, employment guarantee schemes are a part of social assistance. Cambodia will have to devise its own social security and social assistance system.

Appendix One

The Sample Characteristics Data

Table 1. Population and Sample Size

	Village population	Number of house-holds	Sampled house-holds	Proportion of population net
Tonle Sap				
Andong Trach	1,119	196	85	43.4
Krasaing	1,263	228	120	52.6
Khsach Chiros	1,842	305	120	39.4
Mekong Plain				
Prek Kmeng	1,592	339	120	35.4
Babaong	2,571	536	127	23.7
Plateau				
Kanhchor	1,153	278	120	43.1
Dang Kdar	1,422	306	125	40.8
Trapeang Prey	347	68	68	100.0
Coastal				
Kompong Thnaot	2,048	348	120	34.5
Total	**13,357**	**2,602**	**1,005**	**38.6**

Table 2. Main Source of Drinking Water by Percentage Distribution of Households

	Hand pump	Open well	Pond	Stream	River	Other	Total
Tonle Sap							
Andong Trach	59	2	38	0	0	1	100
Krasaing	5	0	92	0	0	3	100
Khsach Chiros	4	0	9	87	0	0	100
Mekong Plain							
Prek Kmeng	14	18	0	66	1	1	100
Babaong	98	2	0	0	0	0	100
Plateau							
Kanhchor	0	1	0	0	98	1	100
Dang Kdar	2	98	0	0	0	0	100
Trapeang Prey	0	78	22	0	0	0	100
Coastal							
Kompong Thnaot	2	0	98	0	0	0	100

Table 3. Percentage Distribution of the Population by Age Groups

	Age Group (years)					
	9 or less	**10 – 19**	**20 – 39**	**40 – 54**	**55+**	**Total**
Tonle Sap						
Andong Trach	28	28	27	11	7	100
Krasaing	27	30	23	13	7	100
Khsach Chiros	31	28	23	12	5	100
Mekong Plain						
Prek Kmeng	30	28	23	11	8	100
Babaong	23	26	26	14	10	100
Plateau						
Kanhchor	28	25	26	11	10	100
Dang Kdar	28	23	29	11	8	100
Trapeang Prey	28	27	28	10	7	100
Coastal						
Kompong Thnaot	26	30	24	11	9	100

Table 4. Percentage Distribution of the Population by Sex, Age 7 And Above

	Male	**Female**	**Total**
Tonle Sap			
Andong Trach	46.4	53.6	100.0
Krasaing	49.0	51.0	100.0
Khsach Chiros	50.8	49.2	100.0
Mekong Plain			
Prek Kmeng	49.4	50.6	100.0
Babaong	46.6	53.4	100.0
Plateau			
Kanhchor	48.2	51.8	100.0
Dang Kdar	48.4	51.6	100.0
Trapeang Prey	45.1	54.9	100.0
Coastal			
Kompong Thnaot	45.0	55.0	100.0

Table 5. Marital Status

		Age group (years)			
		15 – 25	**26 – 35**	**36 – 45**	**46+**
Tonle Sap	Married	16.8	88.2	91.8	75.3
	Single	81.0	9.1	2.4	0.4
	Divorced	0.6	0.0	0.5	0.4
	Widow/widower	1.1	2.7	4.8	23.9
	Deserted	0.4	0.0	0.5	0.0
	Total	100.0	100.0	100.0	100.0
Mekong Plain	Married	16.7	87.2	85.1	67.7
	Single	81.6	9.3	4.3	1.0
	Divorced	0.7	2.9	2.1	0.0
	Widow/widower	1.1	0.6	8.5	30.8
	Deserted				0.5
	Total	100.0	100.0	100.0	100.0
Plateau	Married	22.3	87.4	88.6	65.5
	Single	76.6	7.2	3.1	2.2
	Divorced	0.6	1.3	0.0	0.0
	Widow/widower	0.3	3.6	7.3	32.3
	Deserted	0.3	0.4	1.0	0.0
	Total	100.0	100.0	100.0	100.0
Coastal	Married	24.5	89.9	85.3	57.9
	Single	71.6	5.8	0.0	1.9
	Divorced	1.3	1.4	1.3	1.9
	Widow/widower	1.3	1.4	13.3	37.4
	Deserted	1.3	1.4	0.0	0.9

	Total	100.0	100.0	100.0	100.0

Table 6. Percentage Distribution of Households by Length of Stay in the Village

	Period when household started living in the village				
	Before 979	Between 1979 and 89	Between 1989 and 1995	After 1995	Total
Tonle Sap					
Andong Trach	32	14	41	13	100
Krasaing	11	64	11	14	100
Khsach Chiros	3	61	17	19	100
Mekong Plain					
Prek Kmeng	43	46	7	4	100
Babaong	28	51	9	13	100
Plateau					
Kanhchor	59	24	10	7	100
Dang Kdar	62	14	7	17	100
Trapeang Prey	65	19	10	6	100
Coastal					
Kompong Thnaot	17	71	5	8	100

Table 7. Average House Size and Percentage Distribution of Households by Type of Roofing Used in Their Houses

	Average house Size	Thatched	Tin Roofed	Tile Roofed	Bricked	Other	Total
Tonle Sap	(M^2)			Percentage			
Andong Trach	16	51	47	0	1	1	100
Krasaing	29	37	38	0	1	25	100
Khsach Chiros	25	78	12	9	0	2	100
Mekong Plain							
Prek Kmeng	37	71	11	16	1	2	100
Babaong	30	39	41	19	1	1	100
Plateau							
Kanhchor	48	40	29	30	0	1	100
Dang Kdar	26	70	0	30	0	0	100
Trapeang Prey	26	74	10	16	0	0	100
Coastal							
Kompong Thnaot	31	35	40	15	3	8	100

Table 8. Percentage Distribution of the Population by Education and Literacy

	Cannot read or write	Can read or write little	Can read or write some	Completed primary	Secondary	Tertiary or above	Total
Tonle Sap							
Andong Trach	39	26	22	10	3	0	100
Krasaing	46	25	21	5	4	0	100
Khsach Chiros	36	32	15	11	5	1	100
Mekong Plain							
Prek Kmeng	42	28	19	5	6	0	100
Babaong	23	37	11	20	9	0	100
Plateau							
Kanhchor	21	29	33	10	6	0	100
Dang Kdar	52	29	13	4	2	0	100
Trapeang Prey	43	40	8	5	3	0	100
Coastal							
Kompong Thnaot	40	29	23	4	4	0	100

Table 9: Percentage Distribution of the Population by Participation in the Work Force

	Economically active	Student and work	Student (full time)	Disabled	Too old to work	Too young to work	Total
Tonle Sap			(Percentage)				
Andong Trach	63	7	12	1	4	14	100
Krasaing	62	6	8	1	4	19	100
Khsach Chiros	72	8	5	1	2	13	100
Mekong Plain							
Prek Kmeng	66	17	9	1	4	4	100
Babaong	63	18	7	1	5	6	100
Plateau							
Kanhchor	60	16	13	2	6	3	100
Dang Kdar	68	6	6	2	5	13	100
Trapeang Prey	65	20	11	1	3	1	100
Coastal							
Kompong Thnaot	61	18	9	1	4	8	100

Appendix Two

Land Acquisition and Landlessness Data

Table 1. Distribution of Households by Type of Land Conflicts

	Grabbing by authorities	Grabbed by soldier/ powerful officials	Boundary conflict	Ownership conflict with non-relatives	Owership conflict with relatives	Other	Total
	(Number of Households Having Land Conflicts)						
Tonle Sap Plain							
Andong Trach	1	-	1	1	-	-	3
Khsach Chiros	-	1	3	2	2	1	9
Mekong Plain							
Prek Kmeng	1	-	8	1	-	-	10
Babaong	-	-	9	3	3	1	16
Plateau							
Kanhchor	1	-	1	3	5	1	11
Dang Kdar	-	-	1	5	4	-	10
Trapeang Prey	-	-	-	-	1	-	1
Coastal							
Kompong Thnaot	1	-	3	-	-	-	4
All villages	**4**	**1**	**26**	**15**	**15**	**3**	**64**

Table 2. Resolution of Land Conflicts

	Not resolved, still in conflict	Resolved by compromise	Resolved at the commune level	Resolved by provincial court	Other	Total
	(Number of households having land conflicts)					
Tonle Sap Plain						
Andong Trach	-	-	3	-	-	-
Khsach Chiros	4	2	3	-	-	9
Mekong Plain						
Prek Kmeng	1	6	3	-	-	10
Babaong	3	3	9	-	1	16
Plateau						
Kanhchor	7	1	1	-	2	11
Dang Kdar	4	3	1	-	2	10
Trapeang Prey	-	1	-	-	-	-
Coastal						
Kompong Thnaot	1	-	1	2	-	4
All villages	**20**	**16**	**21**	**2**	**5**	**64**

Table 3. Results of Resolution of Land Conflict

	Lost some land	Lost all land	Didn't lose any land	Total
Tonle Sap Plain				
Andong Trach	1	1	1	3
Khsach Chiros	5	-	4	9
Mekong Plain				
Prek Kmeng	2	-	8	10
Babaong	5	2	9	16
Plateau				
Kanhchor	3	-	9	11
Dang Kdar	3	2	5	10
Trapeang Prey	-	-	1	-
Coastal				
Kompong Thnaot	1	-	3	4
All villages	**20**	**5**	**39**	**64**

Table 4. Assets by Land Holdings

	Grouped land holdings per household				
	Landless	**>0–0.5ha**	**>0.5–1ha**	**>1–3ha**	**>3 ha**
Tonle Sap	Assets excluding farm land (million riels)				
Andong Trach	1.2	1.9	1.9	5.0	10.4
Krasaing	2.0	2.6	3.9	5.1	9.8
Khsach Chiros	0.9	1.3	1.0	1.8	5.4
Mekong Plain					
Prek Kmeng	3.4	2.7	6.7	12.7	9.0
Babaong	5.8	5.4	3.7	8.0	15.1
Plateau					
Kanhchor	6.2	6.2	5.9	6.4	10.9
Dang Kdar	0.8	2.9	3.3	4.9	
Trapeang Prey	0.6	1.0	2.6	3.6	10.0
Coastal					
Kompong Thnaot	1.8	5.5	8.0	15.3	24.3
All villages	**2.9**	**3.8**	**4.7**	**6.4**	**9.2**
Tonle Sap	Total assets (million riels)				
Andong Trach	1.2	3.2	3.3	9.1	34.7
Krasaing	2.0	3.8	6.0	10.6	16.8
Khsach Chiros	0.9	1.5	1.3	2.3	7.3
Mekong Plain					
Prek Kmeng	3.4	3.0	7.3	14.2	12.6
Babaong	5.8	6.4	5.1	11.3	23.6
Plateau					
Kanhchor	6.2	6.7	7.0	8.8	14.6
Dang Kdar	0.8	3.0	3.6	5.4	
Trapeang Prey	0.6	1.4	3.3	4.7	11.6
Coastal					
Kompong Thnaot	1.8	6.4	10.1	18.0	55.7
All villages	**2.9**	**4.4**	**5.7**	**8.9**	**16.0**

Table 5. Household Income by Source and Land Holdings

Source of Income	Grouped land holdings per household				
	Landless	**>0–0.5ha**	**>0.5–1ha**	**>1–3ha**	**>3 ha**
	(million riels per year)				
Agriculture	0.18	0.48	0.79	1.29	1.74
Small business	0.38	0.17	0.33	0.36	0.31
Hiring out labour	0.65	0.38	0.54	0.43	0.42
CPR	0.69	0.54	0.51	0.59	0.72
Other	0.11	0.06	0.07	0.14	0.18
Total	**2.04**	**1.67**	**2.34**	**3.12**	**3.77**
	(percent)				
Agriculture	9	29	34	41	46
Small business	19	10	14	11	8
Hiring out labour	32	23	23	14	11
CPR	34	33	22	19	19
Other	5	3	3	5	5
Total	**100**	**100**	**100**	**100**	**100**

Appendix Three

Farm Productivity and Cost of Production Data

Table 1. Wet Season (or non-irrigated) Rice Cultivation in 2001 by Village

	Farm size grouping	Sample farms	Harvested area (ha)	Production (tonnes)	Yield (tonnes/ha)
Tonle Sap Plain					
Andong Trach	>0 - 0.5ha	5	0.50	0.61	1.22
	>0.5 - 1ha	11	0.98	1.45	1.47
	>1 - 2ha	15	1.82	2.80	1.52
	>2ha	19	3.97	4.26	1.09
	Total	49	2.32	2.89	1.32
Krasaing	>0 - 0.5ha	6	0.37	0.68	2.17
	>0.5 - 1ha	9	0.99	1.42	1.43
	>1 - 2ha	7	1.71	1.59	0.90
	>2ha	20	4.35	2.35	0.52
	Total	41	2.62	1.77	1.03
Khsach Chiros	>0 - 0.5ha	22	0.38	0.42	1.33
	>0.5 - 1ha	20	0.91	1.13	0.93
	>1 - 2ha	20	1.74	1.28	0.71
	>2ha	15	3.88	1.41	0.49
	Total	77	1.55	1.02	0.90
Mekong Plain					
Babaong	>0 - 0.5ha	14	0.28	0.82	3.16
	>0.5 - 1ha	6	0.84	1.86	2.26
	>1 - 2ha	2	1.70	5.50	3.07
	>2ha	1	2.70	11.00	4.07
	Total	23	0.66	1.94	2.96
Plateau					
Kanhchor	>0 - 0.5ha	21	0.33	0.80	2.66
	>0.5 - 1ha	4	0.86	1.66	1.96
	>1 - 2ha	1	1.50	0.72	0.48
	Total	26	0.45	0.93	2.47
Dang Kdar	>0 - 0.5ha	68	0.33	0.57	1.93
	>0.5 - 1ha	30	0.76	0.88	1.22
	>1 - 2ha	10	1.49	1.60	1.15
	>2ha	2	2.28	0.84	0.38
	Total	110	0.59	0.75	1.64
Trapeang Prey	>0 - 0.5ha	26	0.42	0.53	1.35
	>0.5 - 1ha	20	0.96	1.09	1.14
	>1 - 2ha	10	1.68	1.66	1.03
	>2ha	2	3.00	1.68	0.56
	Total	58	0.91	0.96	1.19
Coastal					
Kompong Thnaot	>0 - 0.5ha	63	0.32	0.47	1.49
	>0.5 - 1ha	33	0.72	0.89	1.30
	>1 - 2ha	8	1.58	1.40	0.88
	>2ha	5	4.26	1.50	0.65
Total	Total	109	0.71	0.71	1.35
All Villages					
	>0 - 0.5ha	**225**	**0.34**	**0.56**	**1.82**
	>0.5 - 1ha	**133**	**0.84**	**1.10**	**1.29**
	>1 - 2ha	**225**	**1.69**	**1.84**	**1.08**
	>2ha	**64**	**3.99**	**2.71**	**0.75**
	Total	**495**	**1.15**	**1.17**	**1.43**

Table 2. Dry Season (or irrigated) Rice Cultivation by Village in 2001

	Farm size	Sample	Harvested Area per Household (ha)	Production per Household (tonnes)	Yield (tonnes/ha)
Tonle Sap Plain					
Krasaing	>0 - 0.5ha	20	0.30	0.75	2.64
	>0.5 - 1ha	4	0.74	2.02	2.84
	>1 - 2ha	3	1.65	1.12	0.70
	Total	27	0.51	0.98	2.46
Khsach Chiros	>0 - 0.5ha	14	0.37	0.58	1.73
	>0.5 - 1ha	11	0.93	1.19	1.28
	>1 - 2ha	5	1.45	1.67	1.09
	>2ha	4	3.04	2.45	0.86
	Total	34	1.02	1.16	1.39
Mekong Plain					
Prek Kmeng	>0 - 0.5ha	15	0.29	1.04	3.43
	>0.5 - 1ha	18	0.76	1.94	2.56
	>1 - 2ha	7	1.67	2.96	1.78
	>2ha	5	3.12	6.90	2.19
	Total	45	1.01	2.35	2.69
Babaong	>0 - 0.5ha	9	0.38	1.18	3.12
	>0.5 - 1ha	28	0.83	2.90	3.49
	>1 - 2ha	45	1.68	5.20	3.10
	>2ha	34	3.45	10.24	2.99
	Total	116	1.89	5.81	3.16
Plateau					
Kanhchor	>0 - 0.5ha	37	0.33	0.74	2.49
	>0.5 - 1ha	9	0.87	1.57	1.80
	>1 - 2ha	8	1.25	3.23	2.64
	>2ha	1	4.50	11.00	2.44
	Total	55	0.63	1.42	2.40
All Villages	**>0 - 0.5ha**	**95**	**0.33**	**0.81**	**2.62**
	>0.5 - 1ha	**70**	**0.83**	**2.16**	**2.65**
	>1 - 2ha	**68**	**1.61**	**4.30**	**2.65**
	>2ha	**44**	**3.40**	**9.17**	**2.69**
	Total	**277**	**1.26**	**3.33**	**2.65**

Table 3. Profitability of Wet Season Rice Production by Vand Farm Size

	Farm Size	Sample size	Thousand riels/ household	Thousand riels/ha	Thousand riels/tonne	Percent of total production
Tonle Sap Plain	>0 - 0.5ha	5	115	229	196	88
Andong Trach	>0.5 - 1ha	11	239	244	169	66
	>1 - 2ha	15	536	291	190	71
	>2ha	19	985	244	196	75
	Total	50	599	256	188	73
Krasaing[58]	>0 - 0.5ha	6	107	213	81	25
	>0.5 - 1ha	9	71	71	-6	-1
	>1 - 2ha	7	-61	-38	-266	-83
	>2ha	20	-206	-52	-192	-66
	Total	43	-76	14	-123	-41
Khsach Chiros	>0 - 0.5ha	22	120	387	292	97
	>0.5 - 1ha	20	376	405	296	91
	>1 - 2ha	20	324	200	250	83
	>2ha	15	312	84	260	74
	Total	77	277	284	276	87
Mekong Plain						
Babaong	>0 - 0.5ha	14	186	724	241	91
	>0.5 - 1ha	6	492	607	270	100
	>1 - 2ha	2	405	289	135	50
	>2ha	1	1,602	593	146	56
	Total	23	347	650	235	88
Plateau						
Kanhchor	>0 - 0.5ha	21	148	484	186	54
	>0.5 - 1ha	4	506	573	296	86
	>1 - 2ha	1	92	61	127	36
	Total	26	201	482	201	58
Dang Kdar	>0 - 0.5ha	68	142	490	257	86
	>0.5 - 1ha	30	200	277	213	71
	>1 - 2ha	10	297	209	204	71
	>2ha	2	202	89	248	83
	Total	110	173	399	240	80
Trapeang Prey	>0 - 0.5ha	26	126	316	220	73
	>0.5 - 1ha	20	265	277	239	80
	>1 - 2ha	10	400	254	229	73
	>2ha	2	316	105	184	61
	Total	58	228	285	227	75
Coastal						
Kompong Thnaot	>0 - 0.5ha	63	103	255	155	39
	>0.5 - 1ha	33	243	350	272	68
	>1 - 2ha	8	367	237	272	68
	>2ha	5	362	122	251	63
	Total	109	177	277	203	51
All Villages						
	>0 - 0.5ha	**225**	**129**	**395**	**214**	**68**
	>0.5 - 1ha	**133**	**264**	**322**	**231**	**71**
	>1 - 2ha	**73**	**341**	**209**	**177**	**58**
	>2ha	**64**	**371**	**101**	**95**	**31**
	Total	**495**	**227**	**309**	**197**	**63**

[58] Numbers for Krasaing are negative because floods seriously damaged the crops in that year.

Table 4. Profitability of Dry Season Rice Production by Village and Farm Size

	Farm size	Sample size	Thousand riels/ household	Thousand riels/ha	Thousand riels/tonne	Percent of total production
Tonle Sap Plain						
Krasaing	>0 - 0.5ha	20	32	-205	-163	-51
	>0.5 - 1ha	4	143	174	89	28
	>1 - 2ha	3	43	30	-38	-11
	Total	27	72	-119	-107	-35
Khsach Chiros	>0 - 0.5ha	14	60	218	109	36
	>0.5 - 1ha	11	158	148	78	27
	>1 - 2ha	5	491	316	195	48
	>2ha	4	500	183	147	51
	Total	34	185	184	104	37
Mekong Plain						
Prek Kmeng	>0 - 0.5ha	15	127	425	122	42
	>0.5 - 1ha	18	256	340	123	40
	>1 - 2ha	7	491	298	151	55
	>2ha	5	1,514	471	217	72
	Total	45	390	376	137	46
Babaong	>0 - 0.5ha	9	90	261	66	27
	>0.5 - 1ha	28	393	486	134	54
	>1 - 2ha	45	696	415	133	53
	>2ha	34	1,371	396	125	48
	Total	116	774	415	126	50
Plateau						
Kanhchor	>0 - 0.5ha	37	196	252	219	66
	>0.5 - 1ha	9	536	612	344	99
	>1 - 2ha	8	339	273	148	43
	>2ha	1	3,402	756	309	97
	Total	55	325	317	227	68
All villages						
	>0 - 0.5ha	**95**	**107**	**179**	**93**	**29**
	>0.5 - 1ha	**70**	**325**	**393**	**147**	**51**
	>1 - 2ha	**68**	**589**	**362**	**134**	**49**
	>2ha	**44**	**1,355**	**393**	**141**	**52**
	Total	**277**	**469**	**305**	**122**	**43**

Appendix Four

Indebtedness and Credit Needs Data

Table 1. Outstanding Loans in Cash for the Dry and Wet Season Surveys

	Source of loans	Number of loans		Average loan size (Thousand Riels)		Interest rate per month (percent)	
		Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
Tonle Sap Plain							
Andong Trach	Relative/Friend	5	10	425	147	0.3	4.2
	Money lender	24	13	284	170	8.5	9.0
	NGO	2	2	395	410	3.5	8.0
	ACLEDA	1	3	250	350	4.0	4.7
	Other	1	..	500	..	5.0	..
Krasaing	Relative/Friend	14	25	225	271	4.4	2.0
	Money lender	41	47	287	334	8.0	6.4
	NGO	1	7	100	180	5.0	4.1
	ACLEDA	..	1	..	200	..	5.0
	Other	..	2	..	58	..	4.0
Khsach Chiros	Relative/Friend	67	59	156	133	1.5	0.4
	Money lender	29	26	181	229	6.0	8.0
	NGO	28	11	143	210	2.4	3.4
	Other	12	15	249	130	..	3.6
Mekong Plain							
Prek Kmeng	Relative/Friend	26	20	488	312	2.2	6.3
	Money lender	89	71	373	624	9.6	6.3
	ACLEDA	1	34	3,920	1744	2.0	2.6
	Other	3	1	405	300	..	..
Babaong	Relative/Friend	53	47.00	324	716	1.5	2.0
	Money lender	22	18	689	475	8.5	6.0
	Other	21	..	297	..	3.3	..
Plateau							
Kanhchor	Relative/Friend	63	54	213	175	1.7	0.5
	Money lender	10	3	269	100	7.0	10.0
	Other	20	5	509	192	..	..
Dang Kdar	Relative/Friend	73	47	189	141	0.2	0.7
	Money lender	2	2	225	120	2.5	10.0
	Other	3	3	55	90	..	..
Trapeang Prey	Relative/Friend	3	5	157	250	2.0	3.3
	Money lender	3	5	100	50	10.0	10.0
	NGO	28	40	137	146	4.0	4.0
Coastal							
Kompong Thnaot	Relative/Friend	31	15	158	189	0.2	2.2
	Money lender	23	30	138	124	8.1	6.5
	ACLEDA	21	38	330	284	4.6	3.9
	Other	..	6	..	200		..
All Villages							
	Relative/Friend	**335**	**282**	**232**	**275**	**0.9**	**1.3**
	Money lender	**243**	**215**	**331**	**359**	**7.6**	**6.7**
	NGO	**59**	**60**	**145**	**169**	**3.3**	**4.0**
	ACLEDA	**23**	**76**	**506**	**864**	**4.5**	**3.4**
	Other	**60**	**32**	**377**	**145**	**1.4**	**2.4**
	Total	**720**	**665**	**277**	**354**	**3.6**	**3.5**

Table 2. Interest Rate and Size of Agricultural Land Holding

Land holding (ha)	Interest rate per month	Loan in cash	Loan in kind	Total
Tonle Sap Plain		(Thousand riels per household)		
Landless	5.5	230	15	244
>0.0 - 0.5	3.6	381	53	434
>0.5 - 1.0	4.3	365	34	399
>1.0 - 3.0	4.0	251	52	303
>3.0	3.8	312	46	358
Mekong Plain				
Landless	7.2	843	26	869
>0.0 - 0.5	4.4	462	27	489
>0.5 - 1.0	4.6	446	21	467
>1.0 - 3.0	3.7	1,225	51	1,275
>3.0	4.7	585	32	617
Plateau				
Landless	1.6	400	20	420
>0.0 - 0.5	1.6	194	23	217
>0.5 - 1.0	1.4	170	16	186
>1.0 - 3.0	0.8	226	37	262
>3.0	1.3	87	11	97
Coastal				
Landless	6.4	262	4	266
>0.0 - 0.5	4.4	290	25	315
>0.5 - 1.0	2.7	256	39	295
>1.0 - 3.0	3.6	289	20	309
>3.0	0.0	-	25	25

Appendix Five

Diversification of Rural Livelihoods, CPR and Total Income Data

Table 1. Household Income by Source and Village (average of total households)

	Agriculture (Household farm)	Trade/ Business	Hiring out labour	CPR	Other	Total
Tonle Sap	(Thousand riels per household)					
Andong Trach	823	492	435	820	92	2,662
Krasaing	441	1,069	986	854	231	3,582
Khsach Chiros	663	352	231	744	32	2,023
Mekong Plain						
Prek Kmeng	923	1,392	223	1,031	64	3,633
Babaong	2,195	621	274	103	118	3,311
Plateau						
Kanhchor	430	332	506	411	153	1,831
Dang Kdar	395	299	206	454	28	1,383
Trapeang Prey	481	394	613	35	130	1,652
Coastal						
Kampong Thnaot	692	1,180	697	735	83	3,387
All Villages	**805**	**797**	**454**	**592**	**102**	**2,750**
	(Percentage of Total)					
Tonle Sap						
Andong Trach	31	18	16	31	3	100
Krasaing	12	30	28	24	6	100
Khsach Chiros	33	17	11	37	2	100
Mekong Plain						
Prek Kmeng	25	38	6	28	2	100
Babaong	66	19	8	3	4	100
Plateau						
Kanhchor	24	18	28	22	8	100
Dang Kdar	29	22	15	33	2	100
Trapeang Prey	29	24	37	2	8	100
Coastal						
Kampong Thnaot	20	35	21	22	2	100
All Villages	**29**	**29**	**17**	**22**	**4**	**100**

Table 2. Sources of Income by Quintile of Income Groups in the Nine Villages

Quintile by Income per Adult Unit	Agriculture	Self employed in off-farm work	Hiring out labour	CPR	Other	Total
	(Thousand riels per year per household)					
1st 20 percent (Poorest)	231	250	280	348	34	1,143
2nd 20 percent	487	469	331	564	61	1,912
3rd 20 percent	636	632	405	673	48	2,395
4th 20 percent	942	871	513	672	81	3,080
5th 20 percent (Richest)	1,737	1,422	744	704	289	4,895
	(Percentage of total)					
1st 20 percent (Poorest)	20	22	24	30	3	100
2nd 20 percent	25	25	17	29	3	100
3rd 20 percent	27	26	17	28	2	100
4th 20 percent	31	28	17	22	3	100
5th 20 percent (Richest)	35	29	15	14	6	100

Table 3. Percentage of Household Income by Source and Income Quintiles

		Agriculture	Self Employed	Selling Labour	CPR	Other	Total
		(Percentage of Total Income)					
Tonle Sap Plain							
Andong Trach	1st 20 percent (Poorest)	7	23	26	41	2	100
	2nd 20 percent	29	18	20	32	0	100
	3rd 20 percent	32	19	17	33	0	100
	4th 20 percent	33	20	8	37	2	100
	5th 20 percent (Richest)	36	14	18	24	8	100
Krasaing	1st 20 percent (Poorest)	7	23	48	19	2	100
	2nd 20 percent	9	24	26	34	7	100
	3rd 20 percent	11	36	17	35	2	100
	4th 20 percent	14	24	35	24	4	100
	5th 20 percent (Richest)	16	29	27	14	14	100
Khsach Chiros	1st 20 percent (Poorest)	22	23	12	42	1	100
	2nd 20 percent	22	27	9	42	0	100
	3rd 20 percent	19	22	13	45	1	100
	4th 20 percent	31	19	14	36	0	100
	5th 20 percent (Richest)	48	8	10	31	4	100
Mekong Plain							
Prek Kmeng	1st 20 percent (Poorest)	15	25	9	49	2	100
	2nd 20 percent	19	34	8	36	3	100
	3rd 20 percent	21	34	3	41	1	100
	4th 20 percent	24	40	6	27	3	100
	5th 20 percent (Richest)	34	39	7	19	1	100
Babaong	1st 20 percent (Poorest)	48	18	19	5	9	100
	2nd 20 percent	63	17	8	8	3	100
	3rd 20 percent	68	16	11	3	2	100
	4th 20 percent	71	17	7	2	3	100
	5th 20 percent (Richest)	70	19	6	2	4	100
Plateau							
Kanhchor	1st 20 percent (Poorest)	21	18	29	30	2	100

	2nd 20 percent	18	16	31	30	5	100
	3rd 20 percent	16	16	44	21	3	100
	4th 20 percent	25	16	26	25	7	100
	5th 20 percent (Richest)	29	21	20	17	14	100
Dang Kdar	1st 20 percent (Poorest)	25	24	13	37	1	100
	2nd 20 percent	33	16	15	35	2	100
	3rd 20 percent	27	14	14	42	3	100
	4th 20 percent	32	23	18	26	1	100
	5th 20 percent (Richest)	29	19	16	33	3	100
Trapeang Prey	1st 20 percent (Poorest)	15	32	48	3	2	100
	2nd 20 percent	25	36	35	1	2	100
	3rd 20 percent	28	31	31	1	8	100
	4th 20 percent	30	25	39	3	3	100
	5th 20 percent (Richest)	35	11	37	2	15	100
Coastal							
Kompong Thnaot	1st 20 percent (Poorest)	18	17	21	42	2	100
	2nd 20 percent	22	18	20	37	2	100
	3rd 20 percent	20	20	26	33	2	100
	4th 20 percent	27	27	22	22	2	100
	5th 20 percent (Richest)	21	45	22	8	4	100

Table 4. Income from Different Types of CPR

	Fishing	Hunting	Gathering	Other	Total
	(Thousand riels per participating household/year and percent)				
Tonle Sap					
Andong Trach	799	420	312	228	1,759
(%)	45	24	18	13	100
Krasaing	854	331	476	264	1,926
(%)	44	17	25	14	100
Khsach Chiros	788	-	206	121	1,116
(%)	71		18	11	100
Mekong Plain					
Prek Kmeng	1,084	-	129	92	1,305
(%)	83		10	7	100
Babaong	268	-	50	68	386
(%)	69		13	18	100
Plateau					
Kanhchor	282	1,260	65	578	2,184
(%)	13	58	3	26	100
Dang Kdar	119	157	157	375	808
(%)	15	19	19	46	100
Trapeang Prey	150	-	-	171	321
(%)	47			53	100
Coastal					
Kompong Thnaot	1,050	-	-	373	1,423
(%)	74			26	100

Table 5. Income from Common Presources in Each Village

	Fishing	Hunting	Gathering vegetables	Other	Total per village	Total per household
	(Million riels per village in one year)					
Tonle Sap						
Andong Trach	132.62	1.94	20.86	5.27	160.69	0.82
Krasaing	126.63	5.66	52.48	10.03	194.81	0.85
Khsach Chiros	222.24	0.00	3.67	0.93	226.84	0.74
Mekong Plain						
Prek Kmeng	330.69	0.00	5.11	13.77	349.57	1.03
Babaong	53.14	0.00	0.21	1.73	55.08	0.10
Plateau						
Kanhchor	23.48	2.92	0.75	87.01	114.16	0.41
Dang Kdar	25.38	10.38	10.36	92.79	138.91	0.45
Trapeang Prey	0.30	0.00	0.00	2.05	2.35	0.03
Coastal						
Kompong Thnaot	252.65	0.00	0.00	3.25	255.90	0.74

Table 6. Responses With Reference To Distance of Water and Forest Resources in 2001 Compared to 1998 (Percentage Distribution of Households)

	Compared to before the election in 1998					
	Distance to gather fish and water resources			Distance to collect forest resources		
	Same	Further	Total	Same	Further	Total
Tonle Sap Plain						
Andong Trach	21	79	100	6	94	100
Krasaing	93	7	100	90	9	100
Khsach Chiros	41	59	100	22	78	100
Mekong Plain						
Prek Kmeng	72	28	100	55	45	100
Babaong	60	40	100	56	44	100
Plateau						
Kanhchor	93	7	100	9	91	100
Dang Kdar	56	44	100	24	76	100
Trapeang Prey	94	6	100	81	19	100
Coastal						
Kompong Thnaot	99	1	100	97	3	100
All villages	**70**	**30**	**100**	**48**	**52**	**100**

Appendix Six

Consumption Patterns and Food Security Data

Table 1. Food And Non-Food Daily Consumption per Adult Unit (Average of Wet and Dry Season Surveys)

	Rice	Other cereals	Meat, fish, etc.	Vege-tables	Oil and fats	Fruits	Others	Total food	Total non-food	Total consump-tion
Tonle Sap					(Riels/day)					
Andong Trach	343	67	260	86	22	62	85	925	163	1,080
Krasaing	322	113	351	82	22	53	110	1053	385	1,432
Khsach Chiros	387	47	263	100	40	91	164	1092	207	1,297
Mekong Plain										
Prek Kmeng	322	106	583	192	46	82	233	1564	323	1,876
Babaong	244	51	375	104	27	54	116	971	319	1,288
Plateau										
Kanhchor	351	57	365	115	31	63	136	1118	219	1,333
Dang Kdar	340	67	274	76	24	66	103	950	189	1,137
Trapeang Prey	315	37	242	58	15	31	71	769	98	867
Coastal										
Kampong Thnaot	350	104	720	120	40	135	199	1668	281	1,947
All villages	**330**	**74**	**392**	**107**	**31**	**73**	**140**	**1147**	**253**	**1,395**

Table 2. Non-Rice Food Consumption in the Wet Season Survey as a Proportion of Consumption in the Dry Season Survey (Percentages)

Village	Other cereals	Meat, fish, etc.	Vegetables	Oils and fats	Fruits	Others	Total food (excluding rice)
Tonle Sap							
Andong Trach	103	94	101	98	94	80	94
Krasaing	86	88	75	72	62	55	78
Khsach Chiros	27	70	38	135	30	52	54
Mekong Plain							
Prek Kmeng	69	121	96	93	98	78	100
Babaong	49	66	84	67	76	70	69
Plateau							
Kanhchor	58	71	64	87	55	54	65
Dang Kdar	64	81	81	86	84	72	78
Trapeang Prey	39	90	105	54	64	91	83
Coastal							
Kompong Thnaot	109	81	104	77	81	69	83
All villages	**70**	**85**	**80**	**88**	**69**	**67**	**78**

Appendix Seven

Labour Market Data

Table 1. Earnings by Occupation and Gender among the 15–54 Year Age Group (Riels/Day, M = Male, FM = Female)

	Agricultural. work in village		Off village work (migration)*		Small trade		Fishing		Non-fish aquatic resources		Forest resources	
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Tonle Sap	Round 1 (Dry Season)											
Andong Trach	6,400	3,125	3,386	2,318	-	2,519	3,245	2,875	2,050	3,133	-	-
Krasaing	4,088	3,634	5,355	3,513	3,719	3,844	4,260	3,033	3,530	2,579	-	-
Khsach Chiros	1,590	1,106	1,813	2,283	1,158	1,473	2,495	2,306	-	1,700	500	2,250
Mekong Plain												
Prek Kmeng	3,333	3,635	5,656	5,980	7,436	5,268	4,379	1,682	2,277	2,408	4,125	-
Babaong	3,533	2,630	5,282	2,806	2,250	3,350	4,547	1,000	-	-	6,750	-
Plateau												
Kanhchor	3,956	3,298	5,907	2,840	4,015	1,335	2,711	-	-	-	2,858	844
Dang Kdar	1,753	1,485	2,556	2,535	1,250	1,596	1,743	1,135	1,800	1,700	1,852	1,216
Trapeang Prey	4,000	1,500	5,368	3,943	4,750	1,809	-	-	-	-	1,000	2,583
Coastal												
Kompong Thnaot	-	-	4,675	3,348	5,000	2,676	4,015	2,841	-	-	-	-
All Villages	**3,582**	**2,552**	**4,444**	**3,285**	**3,697**	**2,652**	**3,424**	**2,125**	**2,414**	**2,304**	**2,848**	**1,723**
Tonle Sap	Round 2 (Wet Season)											
Andong Trach	1,200	1,625	3,722	2,150	5,000	3,253	4,309	3,200	1,413	1,977	2,667	-
Krasaing	2,000	3,500	4,625	3,899	6,525	2,542	3,457	1,500	3,533	2,574	4,000	-
Khsach Chiros	-	1,150	6,560	6,105	875	1,756	1,952	1,608	-	-	-	-
Mekong Plain												
Prek Kmeng	1,900	2,875	4,875	2,850	3,833	2,616	3,767	2,804	-	2,200	-	3,000
Babaong	4,833	2,464	5,073	3,726	2,333	2,390	2,378	1,100	-	-	-	5,000
Plateau												
Kanhchor	3,500	3,300	8,389	3,286	1,000	2,030	2,482	1,750	-	-	9,738	1,506
Dang Kdar	2,917	2,375	3,154	2,250	3,643	1,896	1,895	2,050	1,125	500	2,416	1,735
Trapeang Prey	3,600	3,800	4,466	4,773	5,500	2,076	-	-	-	-	-	-
Coastal												
Kompong Thnaot	7,000	3,000	5,784	2,865	6,000	2,550	4,918	3,271	-	-	-	-
All villages	**3,369**	**2,677**	**5,183**	**3,545**	**3,857**	**2,345**	**3,145**	**2,160**	**2,024**	**1,813**	**4,705**	**2,810**

* Excluding migration to Thailand which is discussed separately

Appendix Eight

Crises, Responses and External Assistance Data

Table 1. Percentage Distribution of Households by Prevalence of Crises, and Average Losses, October 2000 to September 2001

	Death of family member	Illness	Crop failure due to pests	Crop damage by flood	Other damage by flood	Animals died or stolen	Theft, robbery or deception	Other crises
Tonle Sap	(Households having faced crises as percentage of total households)							
Andong Trach	8	29	9	80	32	55	9	1
Krasaing	3	88	3	51	5	7	0	5
Khsach Chiros	8	63	77	93	57	43	8	18
Mekong Plain								
Prek Kmeng	5	48	18	13	85	24	28	7
Babaong	6	81	5	50	9	45	1	6
Plateau								
Kanhchor	8	78	24	48	12	20	23	21
Dang Kdar	11	76	55	32	1	47	25	70
Trapeang Prey	4	24	0	0	0	4	1	6
Coastal								
Kompong Thnaot	10	58	7	12	0	37	4	3
All villages	**7**	**64**	**24**	**43**	**23**	**32**	**12**	**16**
Tonle Sap	(Average monetary losses, thousand riels/affected household)							
Andong Trach	1,926	362	43	391	150	65	409	240
Krasaing	156	425	547	1,783	1,960	171	..	180
Khsach Chiros	956	411	297	470	135	315	311	261
Mekong Plain								
Prek Kmeng	123	508	248	653	438	181	136	450
Babaong	1,004	435	258	110	304	328	80	583
Plateau								
Kanhchor	489	284	102	164	78	253	580	429
Dang Kdar	208	338	39	135	110	212	146	757
Trapeang Prey	217	234	..	..	..	233	1,170	158
Coastal								
Kompong Thnaot	618	276	34	97	..	209	579	800
All villages	**648**	**376**	**178**	**514**	**324**	**227**	**306**	**580**

Table 2. Household Response to Crises (Multiple Responses)

	Used savings	Reduced consumption	Took loans	Sold animals	Sold agricultural land	Household members migrated	Children to work for others
Tonle Sap	(Percentage of households having crises)						
Andong Trach	64	63	35	19	4	5	8
Krasaing	55	81	50	6	5	50	11
Khsach Chiros	53	99	57	8	0	4	4
Mekong Plain							
Prek Kmeng	78	50	62	0	0	0	2
Babaong	76	38	36	5	0	2	1
Plateau							
Kanhchor	52	74	53	4	0	1	2
Dang Kdar	81	72	56	14	5	7	7
Trapeang Prey	45	18	32	14	9	14	0
Coastal							
Kompong Thnaot	88	76	48	7	3	3	3
All Villages	**68**	**68**	**50**	**8**	**2**	**9**	**5**

Table 3. External Assistance to Alleviate Crises (By Percentage Distribution of Households)

	Assistance from relatives/friends	Assistance from NGO(s)	Assistance from government
Tonle Sap			
Andong Trach	8	94	67
Krasaing	19	10	18
Khsach Chiros	2	29	46
Mekong Plain			
Prek Kmeng	29	13	98
Babaong	12	0	40
Plateau			
Kanhchor	10	0	26
Dang Kdar	10	11	0
Trapeang Prey	5	0	0
Coastal			
Kompong Thnaot	6	0	0
All villages	**12**	**16**	**35**

References

Acharya, S. (1995), *Some Aspects of Indian Agriculture* (The Hague: Institute of Social Studies) Occasional Monograph 108

Acharya, S. (2001), "Poverty Reduction in Cambodia — Some Reflections," *Cambodia Development Review*, Volume 5, Issue 2 (Phnom Penh: Cambodia Development Resource Institute, April) pp. 4–7

Acharya, S. (2002), "Private Sector in Cambodia — Glimpses from Case Studies," *Cambodia Development Review*, Volume 6, Issue 3 (Phnom Penh: Cambodia Development Resource Institute, July) pp. 1–5

Bhardwaj, K. (1976), *Production Conditions in Indian Agriculture* (Cambridge: Cambridge University Press)

Biddulph, R. (2000), *Making the Poor Visible* (Phnom Penh: Cambodia Land Project, Oxfam GB)

Boserup, E. (1965), *The Conditions for Agricultural Growth* (Chicago: Aldine)

Chan, S. (2001), "The Impact of Cambodia's Recent Floods", *Cambodia Development Review,* Volume 5, Issue 1 (Phnom Penh: Cambodia Development Resource Institute, January) pp. 1–4

Chan, S. & S. So (1999), *Cambodian Labour Migration to Thailand: A Preliminary Assessment* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 11

Chan, S., S. Tep & S. Acharya (2001), *Land Tenure in Cambodia: A Data Update* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 19

Chan, S. & S. Acharya (2002), *Land Transactions in Cambodia* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 22

Chaynov, A. V. (1966), *The Theory of Peasant Economy* (Manchester: Manchester University Press)

Desbarats, J. & B. Sik (2000), "People and Land in Rural Cambodia," *Cambodia Development Review,* Volume 4, Issue 3 (Phnom Penh: Cambodia Development Resource Institute, September) pp. 6–10

Dreze, J. & A. Sen (1991), *Hunger and Public Action* (Helsinki: UNU-WIDER)

Ellis, F. (2000), *Rural Livelihoods and Diversity in Developing Countries* (London, Oxford University Press)

Kang, D. (2002), "Development of Micro Finance in Cambodia," *Cambodia Development Review*, Volume 6, Issue 3 (Phnom Penh: Cambodia Development Resource Institute, July) pp. 6–8

Kato, E. (1999), *Where Has All the Land Gone? Land Rights and Access in Cambodia* (Phnom Penh: Cambodia Land Project, Oxfam GB)

Khan, A. R. & E. Lee (1984) (eds.), *Poverty in Rural Asia, Bangkok* (International Labour Organisation, ARTEP)

Kim, S., S. Chan, & S. Acharya (2002), *Land, Rural Livelihoods and Food Security in Cambodia: A Perspective from Field Reconnaissance* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 24

McAndrew, J. P. (1998), *Interdependence of Household Livelihood Strategies in Two Cambodian Villages* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 7

McKenney, B. & T. Prom (2002), *Natural Resources and Rural Livelihood in Cambodia* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 23

Murshid, K. A. S. (1998), Food Security in an Asian Transitional Economy: The Cambodian Experience (Phnom Penh: Cambodia Development Resource Institute) Working Paper 6

Royal Government of Cambodia (1999), *A Profile of Poverty in Cambodia 1997* (Phnom Penh: Ministry of Planning)

Royal Government of Cambodia (2001), *A Profile of Poverty in Cambodia 1999* (Phnom Penh: Ministry of Planning)

Sen, A. (1980), *Poverty and Famines* (Delhi: Oxford University Press)

Sik, B. (2000), *Land Ownership, Sales and Concentration in Cambodia* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 16

Singh, I. J. (1988), *Small Farmers and the Landless in South Asia* (Washington DC: World Bank) Discussion Paper No. 19

So, S., S. Real, U. Uch, R. Sy, B. Ballard, & S. Acharya (2001), *Social Assessment of Land in Cambodia* (Phnom Penh: Cambodia Development Research Institute) Working Paper No. 20

Sok, H. & S. Acharya (2002), *Cambodia's Annual Economic Review–2002* (Phnom Penh: Cambodia Development Resource Institute)

Srinivasan, T. N. & P. K. Bardhan (1988) (eds.), *Rural Poverty in South Asia* (New York: Columbia University Press)

Tarling, N. (1999) (ed.), *Cambridge History of Southeast Asia*, *Volume 2, Part 1* (Cambridge: Cambridge University Press)

Visaria, P. (1980), Poverty and Unemployment, *World Development*, 9(4)

World Bank (2001), *World Development Report* (Washington DC: World Bank)

Williams, S. (1999), *Review of Secondary Sources Relating to Land Tenure and Access* (Phnom Penh: Cambodia Land Project, Oxfam GB)

Williams, S. (2000), *A Study of the Capacity of Five Provinces to Resolve Conflicts Over Land* (Phnom Penh: Cambodia Land Project, Oxfam GB)

CDRI Working Papers

1) Kannan, K. P. (November 1995), Construction of a Consumer Price Index for Cambodia: A Review of Current Practices and Suggestions for Improvement (Working Paper No. 1) $5.00

2) McAndrew, John P. (January 1996), *Aid Infusions, Aid Illusions: Bilateral and Multilateral Emergency and Development Assistance in Cambodia, 1992–1995* (Working Paper No. 2) $5.00

3) Kannan, K. P. (January 1997), *Economic Reform, Structural Adjustment and Development in Cambodia* (Working Paper No. 3) $5.00

4) Chim Charya, Srun Pithou, So Sovannarith, John McAndrew, Nguon Sokunthea, Pon Dorina & Robin Biddulph (June 1998), *Learning from Rural Development Programmes in Cambodia* (Working Paper No. 4) $7.50

5) Kato, Toshiyasu, Chan Sophal & Long Vou Piseth (September 1998), *Regional Economic Integration for Sustainable Development in Cambodia* (Working Paper No. 5) $6.00

6) Murshid, K. A. S. (December 1998), *Food Security in an Asian Transitional Economy: The Cambodian Experience* (Working Paper No. 6) $9.00

7) McAndrew, John P. (December 1998), *Interdependence in Household Livelihood Strategies in Two Cambodian Villages* (Working Paper No. 7) $9.00

8) Chan Sophal, Martin Godfrey, Toshiyasu Kato, Long Vou Piseth, Nina Orlova, Per Ronnås & Tia Savora (January 1999), *Cambodia: The Challenge of Productive Employment Creation* (Working Paper No. 8) $9.00

9) Teng You Ky, Pon Dorina, So Sovannarith & John McAndrew (April 1999), *The UNICEF/Community Action for Social Development Experience—Learning from Rural Development Programmes in Cambodia* (Working Paper No. 9) $4.50

10) Gorman, Siobhan, with Pon Dorina & Sok Kheng (June 1999), *Gender and Development in Cambodia: An Overview* (Working Paper No. 10) $6.00

11) Chan Sophal & So Sovannarith (June 1999), *Cambodian Labour Migration to Thailand: A Preliminary Assessment* (Working Paper No. 11) $3.00

12) Chan Sophal, Toshiyasu Kato, Long Vou Piseth, So Sovannarith, Tia Savora, Hang Chuon Naron, Kao Kim Hourn & Chea Vuthna (September 1999), *Impact of the Asian Financial Crisis on the SEATEs: The Cambodian Perspective* (Working Paper No. 12) $4.50

13) Ung Bunleng, (January 2000), *Seasonality in the Cambodian Consumer Price Index* (Working Paper No. 13) $3.00

14) Toshiyasu Kato, Jeffrey A. Kaplan, Chan Sophal and Real Sopheap (May 2000), *Enhancing Governance for Sustainable Development* (Working Paper No. 14) $6.00

15) Martin Godfrey, Chan Sophal, Toshiyasu Kato, Long Vou Piseth, Pon Dorina, Tep Saravy, Tia Savara and So Sovannarith (August 2000), *Technical Assistance and*

Capacity Development in an Aid-dependent Economy: the Experience of Cambodia (Working Paper No. 15) $10.00

16) Sik Boreak, (September 2000), *Land Ownership, Sales and Concentration in Cambodia* (Working Paper No. 16) $7.00

17) Chan Sophal, and So Sovannarith, with Pon Dorina (December 2000), *Technical Assistance and Capacity Development at the School of Agriculture Prek Leap* (Working Paper No. 17) $8.00

18) Martin Godfrey, So Sovannarith, Tep Saravy, Pon Dorina, Claude Katz, Sarthi Acharya, Sisowath D. Chanto and Hing Thoraxy (August 2001), *A Study of the Cambodian Labour Market: Reference to Poverty Reduction, Growth and Adjustment to Crisis* (Working Paper No. 18) $7.00

19) Chan Sophal, Tep Saravy and Sarthi Acharya (October 2001), Land Tenure in Cambodia: a Data Update (Working Paper No. 19) $10.00

20) So Sovannarith, Real Sopheap, Uch Utey, Sy Rathmony, Brett Ballard and Sarthi Acharya (November 2001), *Social Assessment of Land in Cambodia* (Working Paper No. 20) $10.00

21) Bhargavi Ramamurthy, Sik Boreak, Per Ronnås and Sok Hach (December 2001), *Cambodia 1999-2000: Land, Labour and Rural Livelihood in Focus* (Working Paper No. 21) $10.00

22) Chan Sophal and Sarthi Acharya (July 2002), *Land Transaction in Cambodia* (Working Paper No. 22) $8.00

23) Bruce McKenney and Prom Tola. (July 2002), *Natural Resources and Rural Livelihood in Cambodia* (Working Paper No. 23) $10.00

24) Kim Sedara, Chan Sophal and Sarthi Acharya (July 2002), *Natural Resources and Rural Livelihood in Cambodia* (Working Paper No. 23) $10.00

Facing the Challenge of Rural Livelihoods: A Perspective from Nine Villages in Cambodia

This paper is a complementary publication to Working Paper 24, Land, Rural Livelihoods and Food Security in Cambodia and examines the status of rural livelihoods in Cambodia by comprehensively studying nine villages, using quantitative methods. The study researches the following: the relationship between land holdings and landlessness; the relationship between farm size productivity and profitability within the context of food security; the nature and availability of agricultural credit; access to common property resources and other non-farm incomes; the nature of rural poverty and labour markets; and the strategies adopted by rural households to maintain livelihoods.

It finds that land and natural resources continue to form the principal source of village livelihoods in rural areas, but that farm incomes are generally low and common property resources are increasingly difficult to access. Additionally, rural landlessness is high, and those who own very small plots of land also face significant livelihood challenges. The study finds that most rural Cambodians earn their living from multiple sources and on average, agriculture provides only about one third of income in the villages studied. This study reveals that wage labour is significant in rural areas and though wage rates are often no more than one dollar a day most family members, including schoolchildren, work for part of the year. Access to credit is a problem in the villages studied and though rural Cambodians need credit on a regular basis, the traditional formal sources of credit are not suitable for rural lifestyles. There is also a significant amount of migration within Cambodian provinces, and sometimes to Thailand to seek work. With respect to food consumption, both rich and poor consume almost the same amount of rice in all seasons, but the poor have to significantly cut back on non-food items during the lean season. Expenditure on health was also revealed to be inelastic and a significant drain on the income of all classes. Finally the study considers the impact of natural disasters and reveals that average losses can be as high as one third of annual income.

The Working Paper also discusses general observations relevant

to policy makers within Cambodia. These observations include agricultural land rationalisation; rural infrastructure development; agricultural

modernisation; development of credit societies; and the need for improved natural resource management, poverty reduction measures and disaster management.

Chan Sophal is a Researcher and Dr. Sarthi Acharya is former Research

Director at CDRI.

CAMBODIA DEVELOPMENT RESOURCE INSTITUTE

$ 10.00

56 Street 315, Tuol Kork, Phnom Penh, Cambodia
(Postal address: PO Box 622, Phnom Penh, Cambodia)
Tel: (855-23) 880-734 / 368-053 / 883-603 Fax: (855-23) 366-094
e-mail: cdri@camnet.com.kh website: http://www.cdri.org.kh