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Working Paper 6

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Contents

This working paper is one of three related papers stemming from a two-year study on food security in rural Cambodia conducted by the Cambodia Development Resource Institute and the United Nations Research Institute for Social Development. The other two papers are Vincent Tickner, 'Food Security in Cambodia: A Preliminary Assessment' (Geneva: UNRISD, October 1996) Discussion Paper 80, and John P. McAndrew, 'Interdependence in Household Livelihood Strategies in Two Cambodian Villages' (Phnom Penh: CDRI, December 1998) Working Paper 7. The CDRI/UNRISD food security project was supported by a grant from DANIDA.

Abstract

This working paper details the results of a study carried out from 1996 to 1997 of 244 households in three villages selected for their contrasting characteristics. One is in a rice surplus area of Prey Veng province; the second, in Kompong Speu province, is in a drought-prone area subject to violent fluctuations in rice production; the third, on the banks of the Mekong River in Kandal province, is primarily a fishing village, but with rice and reed production as additional sources of employment and income. The study therefore covers a range of agro-ecological and socio-economic conditions representative of Cambodia.

The paper finds that rural Cambodians are highly dependent on rice. Rice accounts for between 80 and 84 percent of calorie intake in the three villages, and for between 38 and 50 percent of expenditure on food. In the foreseeable future, rice will continue to be at the centre of food security in Cambodia. But this does not mean that to achieve food security a household has to produce all its own rice. Food security derives from the power to obtain food, whether directly by growing it or indirectly by having something to exchange for it.

Rural poverty and mild to moderate malnutrition are a widespread, though the incidence of "extreme" poverty and severe malnutrition are relatively low. Particularly disturbing is the precarious situation of the rural poor. Compared with many other Asian countries, Cambodia has an abundance of land and the benefit of recent land reform. Yet the poor have increasingly limited access to land, and few own animals. To a large extent, they have to rely on their access to common property resources and the sale of their labour. Migration in search of wage work is desperate in some places, with women in particular taking on heavy labour in agriculture and construction in order to repay loans. As well as financing agricultural production, an important purpose of such loans, at high rates of interest, is to deal with health emergencies, which often have catastrophic consequences.

The paper concludes with recommendations for a phased approach to policy implementation for food security. Interventions in credit and health are seen as a short- to medium-term strategy, along with policies supportive of agricultural and rural economic growth. Work on policies for land and common property resources needs to be started immediately, but these will take longer to implement. A prerequisite of an effective food security policy of any kind is the existence of suitable development institutions at the local level—in the form both of government rural development institutions (currently non-existent at this level) and non-governmental organisations (not operating in the areas of highest food insecurity).

Glossary

Acronyms

FAO	Food and Agriculture Organisation
FDI	foreign direct investment
GDP	gross domestic product
GRET	Groupe de Recherche et d'Echanges Technologiques
GTZ	Gesellschaft fur Technische Zusammenarbeit
HEKS	Swiss Interchurch Aid
HYV	high-yielding varieties
MCC	Mennonite Central Committee
NIS	National Institute of Statistics
NGO	non-governmental organisation
PEM	protein-energy malnutrition
RGC	Royal Government of Cambodia
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNRISD	United Nations Research Institute for Social Development
WAZ	weight-for-age Z-scores
WFP	World Food Programme
WID	Women in Development

Place Names

Kandal province	ខេត្តកណ្តាល
Kompong Speu province	ខេត្តកំពង់ស្ពឺ
Phnom Penh municipality	ក្រុងភ្នំពេញ
Prey Veng province	ខេត្តព្រៃវែង
Lvea Em district	ស្រុកល្វាឯម
Odong district	ស្រុកឧត្តុង្គ
Peam Ro district	ស្រុកពាមរ
Babaong commune	ឃុំបាបោង
Ksem Ksan commune	ឃុំក្សេមក្សាន្ត

Prek Kmeng commune	ឃុំព្រែកក្មេង
Babaong village	ភូមិបាបោង
Prek Kmeng village	ភូមិព្រែកក្មេង
Trapeang Prei village	ភូមិត្រពាំងប្រីយ៍
Neak Loeang	អ្នកលឿង

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The study has benefited from comments and discussions during an initial and final workshop. Discussions with various agencies have also been fruitful. In particular, the World Health Organisation, World Food Programme, Food and Agriculture Organisation, United Nations Development Programme, Helen Keller International, GTZ, CARE and the World Bank deserve special mention. Perhaps our greatest debt lies with our village respondents, from whom we took so much and gave so little in return. If this study has a positive policy impact, then that debt will have been partly addressed.

Chapter One

Introduction

Cambodia is a small country of 11.4 million inhabitants drained by three main river systems: the Mekong, the Tonle Sap and the Bassac. About 86 percent of the country lies within the catchment area of the Mekong. The total area is reported to be 181,035 square km, divided into 24 provinces and municipalities. In 1994, about 60 percent of the land area (11.3 million hectares) was reported to be under forest (FAO 1994). The total cultivated area is estimated at 2.0 million hectares, predominantly devoted to rice cultivation. This is only 11 percent of Cambodia's total land area, and much less than the area under cultivation in the 1960s.

Despite a brutal legacy of violence, genocide and large-scale destruction in which up to a third of the population may have perished, and notwithstanding continuing political instability and widespread plunder of the country's rich natural resources, especially timber, Cambodia has made considerable economic progress in the years following the UN-supervised election in 1993.[1] Over the period 1992–96, the economy grew at a rate of 7 percent per year in real terms, and in the process made significant progress on a number of fronts: vital macroeconomic balance was restored; the domestic currency was stabilised; substantial foreign investment took place; there was a boom in construction and service sector activities; and even agriculture made striking gains (World Bank 1997). This was also the period when economic reforms were introduced and the domestic market was opened up to imports; the trade and tariff regime was rationalised; the government withdrew subsidies and protection; and the domestic market and market institutions began to recreate themselves after years of suppression. Inevitably, numerous problems remain unresolved. Foremost among these are problems of governance, accountability and law and order on the one hand, and political distrust and instability on the other. The domestic budget remains in a precarious state, heavily dependent on customs duties and flows of external assistance, the development infrastructure is in a state of acute disrepair, while basic services such as health, sanitation and safe water elude most rural inhabitants.

It is within this unfolding context of rapid growth that this study on food security in Cambodia was envisaged—as part of a wider effort to examine the consequences of trade liberalisation and structural adjustment policies.[2] Food security was singled out as an area of particular concern, and it was felt that a systematic study was needed, not only to understand the status of food security in the country, but also the dynamic processes and coping strategies

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[1] Two consequences of the Khmer Rouge period (1975–79) are a low sex-ratio (the ratio of males to females), especially in the 40–44 year age-group, and a "deficit" of individuals aged 35–39 with post-primary school education.

[2] The United Nations Research Institute for Social Development (UNRISD) initiated a set of studies in 1994 to probe the impact of rapid change in the context of Cambodia's transition from a war-ravaged, command economy.

at work that affect the ability of the people to have access to sufficient food. During 1996 and 1997, studies with this aim were carried out in three villages with different socio-economic and agro-ecological features.

The importance of this exercise is almost self-evident. Our understanding of food security issues and concerns remains sketchy, based on scattered information and anecdotal impressions. At the same time, both within the country and globally, there have been renewed calls to promote food security as a development objective. In Cambodia, where memories of hunger and deprivation have become firmly etched in the popular mind, such calls assume more than usual urgency.

1) Economic Trends

GDP and Sectoral Performance

Cambodia is one of the poorest countries in the region, with a per capita gross domestic product (GDP) of less than $300 and with about four out of ten people falling below a nutritionally-defined poverty line. However, it has experienced rapid growth in recent years, with rates rising from around 1.2 percent in 1990 to over 7.5 percent in 1995 in real terms. The main contribution to this improved performance came from industry (11.0 percent growth) and trade, transport and services (8.0 percent), while agricultural performance remained volatile at around 3.0 percent (over the period 1991–96), barely keeping pace with the population growth rate of 2.8 percent.

Table 1.1. GDP Composition and Annual Growth Rates (percentage)

	1991	1992	1993	1994	1995	1996 (est.)
Agriculture	51.5	46.4	45.8	43.0	43.7	42.4
Industry	11.6	13.0	15.0	16.3	16.3	16.9
Services	36.9	40.6	39.2	40.7	40.0	40.7
Growth rate[a]						
Agriculture	2.9	0.3	4.1	0.5	6.4	4.9
Industry	11.6	22.3	19.4	15.3	9.5	10.8
Services	12.2	9.6	7.3	11.9	8.2	7.6
GDP	7.6	7.1	4.1	4.0	7.6	7.0

a at 1989 constant prices. Source: RGC (1997a)

At the sectoral and sub-sectoral level, growth in manufacturing was led by ready-made garments and small-scale industry, while in services there was buoyant investment in restaurants, shops and hotels. Although the dominance of agriculture within GDP is unquestionable, there is a distinct movement away from agriculture and towards industry and services.

Employment

The active labour force in 1996 was estimated at 4.5 million people, of which 75.0 percent worked in agriculture (including farming, fishing and forestry), 20.5 percent in services (trade, transport, hotels, public administration, etc.) and 4.5 percent in industry. Generation of new employment opportunities is a high priority due to the backlog of unemployment (particularly acute among the disabled, the internally displaced and refugees) that already exists, and the need to absorb about 135,000 new entrants to the labour force every year.

Macro-Economic Balance

Significant gains have been made in the macro-economic environment. The rate of inflation has been brought under control, mainly through a tight monetary policy. The budget has benefited from an expanded base and better revenue collection, though it remains critically dependent on foreign financing. The trade balance, the balance of payments and the foreign exchange reserve position have improved considerably.

The tax-GDP ratio has improved from 6.2 percent in 1992 to an estimated 9.8 percent in 1996. The revenue-expenditure gap remains substantial (over 7.0 percent of GDP in 1996), leaving the economy highly dependent on aid. External balances also remain extremely dependent on foreign support, though both exports and foreign direct investment (FDI) have registered significant improvement in recent years. The heavy dependence on timber exports is still much in evidence, accounting for about 70 percent of total official exports (World Bank 1997). If illegal flows were taken into account, this figure would rise considerably.

Agricultural Performance

The contribution of agriculture to GDP stood at 42.4 percent in 1996, down from 51.5 percent in 1991. The Cambodian economy nevertheless remains substantially agrarian and rural. It is estimated that 85 percent of the population is rural and 80 percent of the labour force depends directly on agriculture (including forestry and fishing) for income and employment. It would follow therefore that the bulk of the poor, many of whom are from female-headed households, reside in rural Cambodia.

Rice is the most important crop, accounting for a third of the total value of agricultural production. However, "other crops" and livestock production also make important contributions (taken together, their importance is greater than that of rice production), while forestry and fisheries provide additional sources of income and employment (Table 1.2). Cambodian agriculture, therefore, would appear to be quite diversified and not overwhelmingly dependent on any one sector.

Table 1.2. Structure of Agriculture (percentage)

	1991	1992	1993	1994	1995	1996
Paddy rice	31.5	35.3	37.8	30.0	33.2	32.8
Other crops	22.1	22.6	19.0	17.7	17.6	17.9
Rubber	2.3	1.7	1.5	2.8	2.5	2.6
Livestock	32.0	23.5	26.2	25.6	25.4	25.5
Fishery	7.8	11.2	7.2	7.9	7.8	7.3
Forestry	7.8	11.2	7.2	7.9	7.8	7.3

Source: RGC (1997a)

Rice accounts for 90 percent of cultivated acreage, which in 1995–96 was around 1.8 million hectares, still far below the level achieved in 1966–67 of 2.5 million hectares. This is largely a result of the disappearance of mechanised rice farming from the Tonle Sap plains. The area under other annual crops is small in comparison with rice. Although there is great potential for expanding the area under rice cultivation, this will entail expensive demining and investment in irrigation. Given low rice yields (1.31 tons per hectare in 1993/94), production increases can occur more quickly through intensification (see Table 1.3 overleaf).

In terms of rice production systems, rain-fed, lowland rice which is harvested between mid-October and the end of November, depending on the variety in question, accounts for about 85 percent. Deep water rice accounts for only 5 percent of the area, while rain-fed upland rice accounts for another 2 percent. Irrigated dry season rice (both fully irrigated and

Table 1.3. Paddy Yields per Hectare in Selected Countries (1991-95)

Cambodia	Vietnam	Laos	Thailand	Indonesia	Philippines
1.37	3.42	2.57	2.23	4.35	2.81

Source: FAO (1996)

that receiving supplementary irrigation) accounts for the remaining acreage. There is clearly significant potential for expansion of rice production both by extending the land area and through greater cropping intensity and improved yields.

Rice Production

Food security entails higher levels of food consumption, and this is likely to be more readily achieved if production levels are satisfactory. Indeed, much of the focus on food security has been concerned with supply-side issues, issues relating to improving productivity, stabilising output or promoting modern agricultural practices. It is often assumed that production increases are necessary for better food security and will automatically lead to higher consumption levels (RGC 1997b:13).

As far as paddy rice is concerned, significant increases in production have taken place in the last six years, from 2.10 million tons in 1991 to 3.32 million tons in 1995 and 3.39 million tons in 1996, *i.e.* an increase of more than 61 percent over the period 1991–96. The rice supply situation is therefore comfortable, at least in aggregate terms. At the provincial level, a number of provinces reported a deficit in 1996 (estimated consumption minus local production), which presumably were covered through internal trade.[3]

Further increases in production will depend on the incentive environment facing farmers. Do they have access to the free market price (which would be somewhere between the price attainable for exports and that for imports of rice), or are there strong imperfections in the market that deny them adequate access? How efficient are commodity, input and credit markets in Cambodia? The dominant view seems to be that market imperfections are strong, arising out of infrastructural bottlenecks, toll collection and general absence of the rule of law and adequate flows of information. Under such circumstances, both producers and consumers are going to suffer. In general, our understanding of the incentive regime facing farmers is unsatisfactory. There is nevertheless a strong belief that the country does enjoy comparative advantage in rice production, an advantage that should be exploited.

2) Food Security and Poverty

There is a strong view in Cambodia that food security equals rice security equals rice production equals rice consumption. The story that is frequently cited is as follows:

- Cambodia is overwhelmingly rural, with about 80 percent of the people living in villages, the vast majority of whom are farmers;
- Agriculture is the largest sector, accounting for 50 percent of GDP, and within agriculture rice is the most important crop;
- Rice is the most important source of calories for the people, accounting on average for 75 percent of calorie requirements;

Thus, it is implied, for Cambodia food security has to do primarily with the production and consumption of rice: "Rice production is a key factor in household food security in Cambodian rural areas. Many households are not self-sufficient in rice. Seventy percent of house-

[3] Five areas (excluding Phnom Penh) were identified as "deficit" in 1997: Kandal, Kompong Cham, Sihanoukville, Kratie and "other provinces" (FAO/WFP 1997).

holds produce less than 50 percent of their rice requirements" (NIS 1995:15). In other words, food security equals rice security equals production of rice equals consumption of rice.

In principle, production and consumption need not be closely related, unless one assumes a highly subsistence-oriented, undiversified economy. In practice, the matter can only be resolved empirically.

Rice as a Source of Calories

Rice dominates the Cambodian diet, perhaps accounting for as much as 75 percent of total calorie intake. An attempt was made to cross-check this using household survey data on rice consumption by weight (NIS 1995). If average per capita calorie consumption is assumed at 2,200 calories per day, then the calorie contribution of rice would indeed appear to be in the region of 75 percent of total calories. Availability figures suggest that instead it is somewhat lower, at around 64 percent (FAO 1996).

Rice Production as a Source of Income

According to one report (based on two survey rounds), rice production was not generally found to represent the major source of household income: only around 5 percent of households reported rice as the largest component of their total income (Helmers *et al.* 1997a, b). Data from the National Institute of Statistics (NIS 1995) provide corroborative evidence, showing that paddy rice production accounts for less than 11 percent of total rural household income. In other words, the role of rice production is not very important as a source of income. It is not surprising therefore that this study found many households to have large rice "deficits," a situation which was perhaps erroneously interpreted as food insecurity.

Poverty Incidence

Recent estimates of poverty based on household expenditure surveys in 1993–94 and 1997 suggest that between 35 and 40 percent of Cambodians live below the poverty line, defined in terms of a calorie-norm of 2,100 calories per capita combined with an allowance for non-food needs (UNDP 1997). The estimates of the "depth" and "severity" of poverty are low, so that most of the poor are marginally so and are located immediately below the poverty line.

Table 1.4. Poverty Indices by Region, 1993-94 and 1997 (percentage)

	Population share	Headcount index		Poverty gap		Severity index	
		1993–94	1997	1993–94	1997	1993–94	1997
Phnom Penh	10.7	11.4	11.1	3.1	2.2	1.2	0.6
Other urban areas	11.0	36.6	29.9	9.6	7.5	3.6	2.7
Rural areas	78.2	43.1	40.1	10.0	9.7	3.3	3.4
Total	100.0	39.0	36.1	9.2	8.7	3.1	3.1

Source: World Bank (1996)

The poor are generally rural, with the incidence of poverty highest among the farming population. Some evidence is available to show an increase in consumption inequality between 1993–94 and 1997, though in absolute terms there appears to have been an improvement in the situation of the poor (Knowles 1998).

A more critical look at the data base, however, exposes some difficulties. According to the 1993–94 socio-economic data, rural households spend 58 percent of total expenditures on

food, with the top decile averaging 46 percent and the bottom decile averaging 67 percent.[4] However, it is interesting to note that within food, rice accounts for 15.5 percent of food expenditures (and only about 10 percent of total expenditures). Unfortunately, the breakdown of food expenditures is not available by expenditure deciles. Nevertheless, the implications of these data are far-reaching. They suggest that, in a poor economy believed to be characterised by widespread food insecurity, only a small fraction of total expenditures are spent on rice (which provides the bulk of calories consumed). It is therefore unlikely that rural Cambodia is suffering from an acute and widespread food (rice) insecurity situation, because even in the worst of times, households would be able to divert expenditures from less urgent uses to increased consumption of the staple food. The relatively large weight of non-rice foods in aggregate food expenditures should also be noted. The situation in 1996 and 1997 has, if anything, improved over 1993–94 (UNDP 1997; Knowles 1998).

Although the evidence quoted is of uneven quality, there does seem to be a case against the widespread view among donors and policy-makers that large numbers of rural Cambodians are unable to address their basic calorie needs.[5] The suggestion that the depth and severity of poverty is low for Cambodia also points to the same conclusion, since even a small change in the definition of the poverty line (which is, after all, a purely mechanical construct) will lead to a sharp change in the estimate of poverty. This does not mean, however, that there is no food insecurity.

Quite apart from a static, calorie-centric view of food consumption and food security, there is the dynamic or stability aspect of security revolving around the degree to which income, employment and consumption are cushioned from risk and uncertainty, and the general overall perception of such risks at the household and community levels.

Some Regional Comparisons

In terms of daily calorie availability from cereal, vegetative and animal products, Food and Agriculture Organisation (FAO) estimates suggest a figure of 2,256 calories per capita for the period 1992–94. Of this, cereals and animal products account for 64.4 percent and 26.3 percent respectively. The availability of animal-based calories is higher than most countries in the region, while cereal availability is lower. On average, therefore, it would appear that availability exceeded requirements (estimated at 2,110 calories for 1995—FAO 1996).

Table 1.5. Per Capita Energy Availability, 1992–94 (calories per day)

	Cereals and products	Non-cereal vegetative prod.	Total animal products	Total
Bangladesh	1,669	290	63	2,022
Cambodia	1,453	210	593	2,256
Sri Lanka	1,297	832	102	2,231
Indonesia	1,657	834	166	2,657
Laos	1,590	385	325	2,300
Vietnam	1,656	441	205	2,302
Thailand	1,326	798	1,209	3,333

Source: FAO (1996)

From Table 1.5, it would appear that total calorie availability in Cambodia is close to regional norms, though rice-based calories may be a problem. It is noteworthy that animal

[4] In general, the proportion of expenditures on food decreases with income and consumption levels. In most developing countries of Asia, the figure ranges from 40 to 60 percent. The Cambodian figures are towards the upper end.

[5] The draft *Human Development Report* (UNDP 1997) seems to be in agreement with this view.

products make a large contribution to the total availability, second only to Thailand in the region. However, availability need not mean access, and for vulnerable socio-economic groups it usually does not.

Poverty comparisons with Vietnam, Laos and Indonesia show that the position of the three countries of former Indochina is much worse than that of Indonesia, while the position of Cambodia is intermediate between Laos and Vietnam (UNDP 1997).

Demographic Aspects

Most other indicators of welfare and quality of life are unfavourable for Cambodia. The population growth rate is high, between 2.8 and 3.0 percent per year. The infant mortality rate (per 1,000 live births) is 116, which is the highest in Asia after Bhutan, and life expectancy for men is only 50.1 years and for 52.9 years for women. Access to services such as health and safe water is grossly inadequate, with only 12 percent of the rural population having access to safe water. Although literacy indicators are better, these still fall below sub-regional levels, with male literacy at 78 percent and female literacy at 50 percent.

The Nutritional Dimension

The United Nations Children's Fund (UNICEF) has generated country-wide findings on the nutritional situation in Cambodia, especially as it relates to child nutrition (UNDP 1997). These findings may be summarised as follows:

- One in every two children under the age of two is malnourished. This is the highest rate in Southeast Asia;
- Malnutrition is more common in rural areas than in urban areas, and affects both girls and boys equally;
- Malnutrition rises sharply after six months, reaching a peak at 18 months and stabilising at five years;
- Breastfeeding is common (for an average period of 18 months). The sharp rise in malnutrition at this age is due to lack of complementary foods;
- The incidence of illness, especially diarrhoea, is high among the 6–24 month age-group, and is a major cause of malnutrition;
- In rural areas, malnutrition is evenly distributed along the socio-economic spectrum, implying a low overall level of socio-economic development of the population.
- Protein-energy malnutrition (PEM) among children under five is around 50 percent (moderate around 35 percent and severe around 20 percent). It is estimated that if PEM were reduced by half, 20,000 lives could be saved each year (UNDP 1997).

3) Organisation of the Study

Chapter Two presents the conceptual framework and discusses methodological issues. The status of food security and food intake is discussed in some detail in Chapter Three, including nutritional issues and poverty measures, while Chapter Four explores sources and levels of earning and incomes. Chapter Five examines household access, ownership and distribution of assets. Chapter Six focuses on food production, prices and the pattern of the marketed surplus, and Chapter Seven is concerned with the extent and terms of market participation of households in some critical markets, namely in land, labour, credit and output. Chapter Eight provides an analysis of crises experienced and patterns of responses and adjustments that they

induce among different household categories, and Chapter Nine concludes the working paper with a summary of principal findings and policy implications.

Chapter Two

Conceptual Framework and Methodological Notes

1) The Conceptual Framework

The basic concern of this study relates to the question of access to sufficient food by rural households and the stability of food consumption over time, space and across seasons. This concern is rooted in a number of factors: low agricultural productivity, a weak rural infrastructure, a fragile marketing and distribution system, a history of internal strife and displacement, and destruction of local-level institutions and structures of governance.

The question of access is complex and is perhaps best embodied in the concept of entitlements (Sen 1981). Access to food can be achieved through many ways: production, barter, trade, begging, borrowing, scavenging or gathering. It is determined by numerous competing forces that affect the ability of individuals and households to achieve a sustainable, stable pattern of consumption. Thus, it is essential to take a broad and holistic view of food security so that both static and dynamic dimensions can be captured, while at the same time remaining aware of potential trade-offs.[1] The approach taken by this study is detailed below.

The Household as the Basic Unit

The focus of the study is on the household, which has been treated as the basic unit of analysis. However, it has been assumed that households are not isolated units but are engaged in a myriad of cross-cutting relationships designed to ensure viability, reproduction and continuity. In order to understand household food security, it is necessary to investigate the nature of these relationships and interactions, not only among different types of households, but also with larger structures such as the market, local institutional structures and the state.

Market and Non-Market Flows

At its simplest, the household can be viewed as a source of or a target for different kinds of economic flows (of incomes, goods, services, etc.). These flows can be mediated either through the market or through non-market channels. Even in a subsistence economy like that of rural Cambodia there are considerable market-mediated flows leaving and entering the household economy, and these flows have obvious implications for household welfare. Thus, we have attempted to locate the household within the context of various markets, as buyers or sellers or both (in the market for food staples, other agricultural commodities, labour, land,

[1] For example, it is perfectly possible to achieve short-term food security at the expense of longer term viability if productive assets are liquidated; another example would be the trade-off between food and non-food expenditures.

credit, etc.). In this connection, it is important to investigate the scale, extent, determinants and terms of market participation.

Non-market flows are extremely important in rural Cambodia. Several categories may be distinguished:

- *Subsistence production*—Every rural household tries to ensure that it has enough rice to meet its annual consumption requirements. Those that do not themselves produce enough rice try to arrange sufficient purchases from the market for retention as stock. Thus, a large part of production, especially of rice, does not enter the market at all. Similarly, payments for services or labour often consist of meals and equivalent labour, within a mutual exchange network, without necessarily entering into a market matrix;
- *Hunting, gathering and collection activities*—These can be important as a source of income or consumption or as expenditure-saving mechanisms;
- *Receipt of gifts and charity*—Originating from better-off kin or the wat, these can also be important for poorer households, especially in times of shortage.

A primary determinant of access to food is access to resources. Thus, the study begins with an examination of household resources (land, animals, human capital, labour and other assets) which have an important bearing on the character and scale of both market and non-market flows. We then look at household involvement in each of the following markets:

- Rice/paddy market;
- Wage-labour market, patterns of household labour use (self-employment, mutual exchange, etc.);
- Market for assets (land, animals, etc.);
- Credit market.

For each market, we are interested in scale, terms of exchange, seasonalities and differentials with respect to gender and socio-economic class.

Stability of Consumption

Although consumption levels may be satisfactory on average, a number of factors could lead to short-term destabilisation. It is in this context that (regular) seasonalities as well as (irregular) random shocks that affect household consumption require exploration. The seasonal dimension essentially relates to the nature of agricultural production, which is concentrated in certain periods, while consumption demands are evenly spread throughout the year. These could combine with irregular shocks such as flooding and drought to aggravate the problem, usually by lengthening and deepening the period of seasonal shortages. Apart from generalised weather-related shocks, households are likely to experience other emergencies that may have an impact on their food security status. These could relate to illnesses, injury and even death, loss of a productive assets such as animals or land, and indebtedness.

Coping Mechanisms

There may be complex ways in which households try to adjust to shocks in order to preserve their food consumption levels. These include drawing on savings, borrowing, sale of assets, migration, reduced consumption, and so on. Some of these adjustments also have strong implications for food security, especially when assets become threatened or long periods of under-consumption reduce efficiency.

Community and Social Institutions
Although the discussion above has tended to abstract from the role of institutions, we are aware that households do not interact only among themselves but also with institutions and bodies guided by norms, obligations and duties. The economic and social viability of a household is greatly influenced by the nature of these relationships. Thus, ideally, we need to look at property rights, access to common property resources, the nature of patron-client relationships, the legal arbitration regime at the local level, and the local power structure. In practice, we have only been able to focus on some of these issues in a selective manner, and hope that these areas will be taken up for vigorous study by other researchers.

2) Methodological Approach

Area Selection
Ideally, it would have been desirable to select a nationwide, representative sample for this study. Resource limitations, including the scarcity of trained researchers and the difficulties of working in large parts of the country where considerable problems of access and insecurity remain, have forced us to be modest (and perhaps innovative). Three villages were purposefully selected for in-depth investigation. An effort was made to ensure that a wide range of agro-ecological and socio-economic conditions were covered, so that the variation or range of experience with regard to food security issues could be captured. The three villages selected were as follows:[2]

- A village in the province of Prey Veng which is a rice surplus area. The main crop is flood-recession rice. Adoption of high-yielding varieties (HYV) of rice is widespread and supplementary irrigation is common. In terms of infrastructure, the area is well-connected by road. On all counts, this would be considered a prosperous village;
- In sharp contrast to the village above, a rice deficit area was chosen from the province of Kompong Speu. The area is drought-prone and experiences violent rice production fluctuations. The village economy is less diversified, with palm-sugar processing an important secondary activity for many households. Only traditional rice varieties are grown under rain-fed conditions;
- The third village selected lends an additional dimension to the study. It is situated on the banks of the Mekong River in the province of Kandal. It is a fishing village but agriculture is an important secondary activity. The main crops grown are rice and reeds. Since the area remains flooded for considerable periods of time, animal raising is not popular.

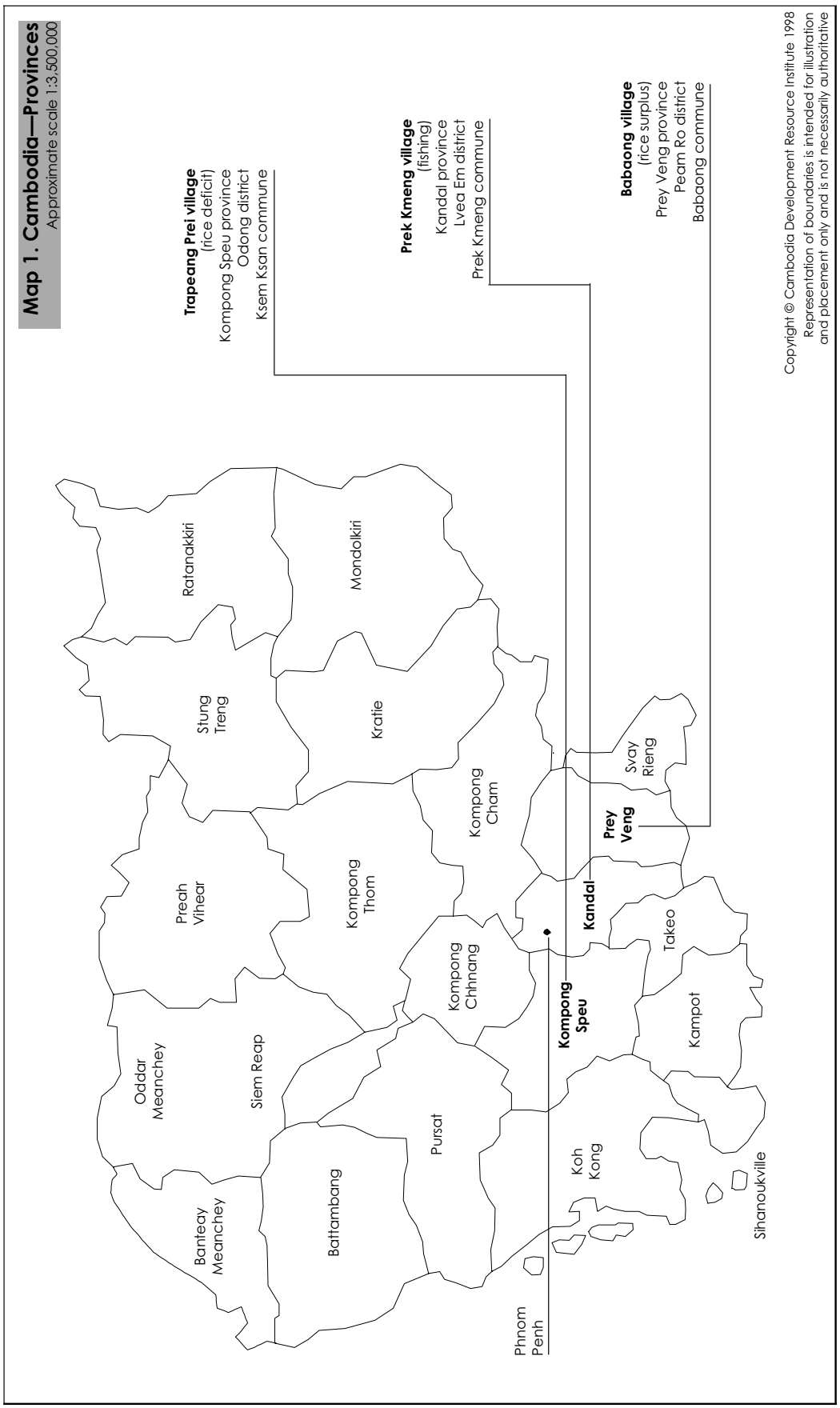
Sample Size
The total number of households covered were 244, broken down as follows:

- Prey Veng: 100 out of 462
- Kompong Speu: 64 out of 64
- Kandal: 80 out of 253

Samples from Prey Veng and Kandal villages were drawn at random.

Investigative Techniques Used
Two types of data were generated through the questionnaire approach: quantitative data and qualitative data. The latter were used to gauge perceptions, especially to understand time trends. In the absence of bench-mark information, recourse to memory recall has had to be carefully employed.

[2] Basic characteristics of the study areas are described in Appendix Two.


Map 1. Cambodia—Provinces
Approximate scale 1:3,500,000
Trapeang Prei village
(rice deficit)
Kompong Speu province
Odong district
Ksem Ksan commune
Prek Kmeng village
(fishing)
Kandal province
Lvea Em district
Prek Kmeng commune
Babaong village
(rice surplus)
Prey Veng province
Peam Ro district
Babaong commune
Ratanakkiri
Mondolkiri
Stung Treng
Kratie
Svay Rieng
Kompong Cham
Prey Veng
Preah Vihear
Kompong Thom
Kandal
Takeo
Kompong Chhnang
Kompong Speu
Kampot
Oddar Meanchey
Siem Reap
Pursat
Koh Kong
Sihanoukville
Battambang
Banteay Meanchey
Phnom Penh
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and placement only and is not necessarily authoritative

An important element of the study is to focus on seasonal patterns of consumption and income flows. Thus, two rounds of field surveys were executed, with the first round taking place in the October–November lean season. The second round, in February–March, was designed to capture the post-harvest situation in the study areas.

Anthropometric data were collected for children under five (height, weight and age), in the second round survey. This is a useful way to look at the nutritional status of children.

In-depth case studies were instituted by well-trained researchers who took up residence in two of the villages. This approach has been fruitful in complementing the quantitative data generated by the questionnaire-based survey. Key respondents were identified in each village to tap into local knowledge.[3]

3) An Approach to the Socio-Economic Stratification of Households

It is essential for analytical purposes to be able to classify rural households in terms of some indicator(s) of wealth and affluence. There is, however, no accepted way of doing this in the present Cambodian context. Land ownership is often used in South Asia as a convenient proxy for wealth of households. It is not at all clear whether this would serve the purpose in a country such as Cambodia, which is not land constrained, where redistributive land reforms were implemented in the recent past, and where differential household welfare may be more closely related to other factors such as labour supply, access to common property resources, ownership of animal assets, adoption of new technology, and so forth. This suggests that instead of relying on one indicator, it may be better to adopt a multi-dimensional approach.

A preliminary list of 15 basic indicators was first established:

1. Land ownership;
2. Value of animal assets;
3. Ownership of durable goods, transportation, equipment, machinery;
4. Other assets, e.g. shops, rice mills, etc.;
5. Rice production—the degree of surplus or deficit;
6. Regularity of income and employment;
7. Visual impression of housing conditions (state of repair, size, construction materials);
8. Visual impression of material conditions (clothes, furniture, utensils);
9. Visual impression of health conditions;
10. Number of adult income earners and number of dependants;
11. Paddy rice stocks (number of months of consumption);
12. Consumption loans, tied credit, state of indebtedness;
13. Migration;
14. Hiring or selling of labour;
15. Educational levels of members.

A scoring system was devised for each of the indicators above. For each household, each of these indicators was graded on a scale of 1 to 6 as follows:

1. Highly positive/desirable +++
2. Significantly positive/good ++
3. Marginal (but assessed as being mildly positive) +
4. Marginal (but assessed as being mildly negative) -
5. Significantly negative --
6. Acutely negative/adverse ---

[3] The case studies form a separate working paper which is a companion to this volume—John P. McAndrew (1998), *Interdependence in Household Livelihood Strategies in Two Cambodian Villages* (Phnom Penh: Cambodia Development Resource Institute) Working Paper 7.

After completing this exercise for each household for all 15 indicators, the researchers discussed what overall rank to attach to a given household, taking into consideration the scores for each of the separate indicators. On this basis, six groups emerged: rich (+++), well-off (++), marginal (positive) (+), marginal (negative) (-), poor (--) and very poor (---). This preliminary assessment was further cross-checked during the second round of field surveys by incorporating the self-assessment of the respondent households (which generally tends to overstate the negative) and the assessment of co-villagers and key respondents. It will be obvious that the degree of subjectivity inherent in this approach poses few problems at each end of the scale, but could be significant at the centre, such as between the two marginal categories. One option would be to combine the two into one and simply call it "marginal."

During the course of this iterative procedure, it became clear that the number of indicators could be drastically reduced to five basic variables from the full list of 15 (because of the high degree of co-linearity among variables), without affecting household rank:

1. Land ownership, adjusted for productivity;
2. Ownership of transportation, machinery and consumer durables;
3. Animal assets;
4. Housing conditions;
5. Family labour (people aged above 16) to dependants (children and the elderly).

In order to minimise the element of subjectivity, however, it would be important to assign rankings to the above variables on the basis of clear criteria. A suggested approach is reported in Appendix One. The result of the above exercise is reported below (Table 2.1).

Table 2.1. Distribution of Households by Socio-Economic Categories (percentage)

	Prey Veng (surplus)	Kompong Speu (deficit)	Kandal (fishing)
Rich	21.0	6.7	-
Well-off	34.0	31.7	8.8
Marginal (positive)	27.0	13.3	47.5
Marginal (negative)	9.0	6.3	10.0
Poor	5.0	21.7	26.3
Very poor	4.0	18.3	7.5

Chapter Three

The Status of Food Security

A lot of energy is expended on what it is that is meant by food security. A recent review of the available literature has identified almost 200 definitions. Doubtless many more will emerge in the future. The phrase is frequently used inter-changeably with poverty alleviation or as an adjunct to it, suggesting that for most purposes the two go hand in hand. One difference between the two is in emphasis. Food security focuses principally on access to food and ensuring adequate consumption levels, usually of the main staple. Poverty alleviation, on the other hand, while certainly encompassing the food element of the equation, is also concerned with non-food basic needs or with "quality of life" aspects. The focus of this chapter is on consumption, in particular consumption of food and food-grains, as the most direct indicator of well-being and as the basis of poverty measures.

1) Rice and Food Consumption

Direct data on rice and food consumption (by weight and value) was generated for a 24-hour reference period from each of the survey rounds. This includes detailed information on various food items consumed, including foods purchased, collected, gathered or produced/processed in the home.[1] This is the main body of consumption data used in this study. In addition, expenditure data on food (both purchased and home-produced/gathered), is separately available for a recall period of three and four months for each round respectively, along with data on non-food expenditures.

The village population is not seasonally static. The total number of people eating in each household declined in the second round compared to the first in two of the areas (Prey Veng and Kompong Speu) and increased slightly in the third (Kandal). In fact, the reduction in Kompong Speu is striking.

The reasons are likely to relate to people looking for work outside and migration (Kompong Speu and Kandal) and an inflow of labourers from outside (Prey Veng).[2] The main point here is that household composition (in terms of consumption units) does not remain static, but is subject to significant shifts, at least seasonally.

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[1] For many items, this meant estimating weights and quantities, and ascribing a market value—a process clearly subject to errors.

[2] Use of the names Prey Veng, Kompong Speu and Kandal in this and subsequent chapters does not refer to conditions typical of that particular province. Rather, it refers to conditions typical to a particular agro-ecological and socio-economic environment—rice surplus, rice deficit and fishing (see Chapter Two).

Rice Consumption

In per capita terms, there is little or no difference in the rice consumption estimates between the two periods. However, in terms of per adult-unit,[3] consumption levels were lower in the second period in Prey Veng and Kompong Speu, and slightly higher in Kandal. The (seasonal) differences are not large and suggest a stable pattern of rice consumption.

Consumption by socio-economic strata also fail to throw up any significant differences. The rich and the very poor consumed around 0.60 and 0.57 kg of rice per adult-unit in the first round. In the second round, the figures were 0.57 and 0.54 kg. Regional contrasts on the other hand, were found to be sharper, especially in the first round.[4]

In terms of total calories, seasonal effects were small in Prey Veng and Kandal but significant in Kompong Speu (Table 3.1).

Table 3.1. Rice Consumption (kg per day)

	Per adult unit		Per capita		Calories[a]	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Prey Veng (rice surplus)	0.59	0.56	0.45	0.43	1,977	1,876
Kompong Speu (rice deficit)	0.56	0.54	0.37	0.40	1,876	1,809
Kandal (fishing)	0.51	0.53	0.37	0.39	1,709	1,776

a Calories are in adult units

The peak food consumption season in Kompong Speu is from mid-October to mid-January, while the lean period is from mid-July to mid-October, corresponding to the rice harvest and pre-harvest periods. The poorer households depend on collection of wild plants, especially yams, and often need to resort to credit during the lean period. From February to April, 90 percent of the non-rice food consumption has to be purchased, typically smoked fish, fish paste (*prahoc*), etc. At this time, collection activities come to a virtual halt. Vegetable collection is limited to the period June–July, while crabs, frogs, and snails are collected during the early rainy season from July–August.

The contribution of rice to total calories is high, indeed higher than is conventionally assumed.[5] Our estimates put the figure at around 80 percent, suggesting an extremely heavy dependence on rice. Rice-based calorie intake is highest for the poorest, both in absolute and relative terms. However, the differences observed across the socio-economic spectrum are small (Figure 3.1).

Consumption Equals Production?

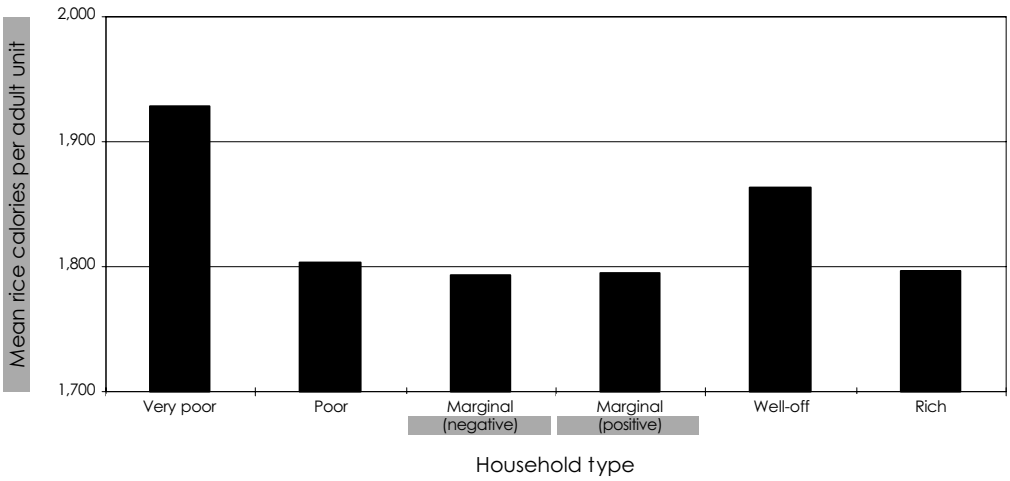
An important determinant of rice consumption is thought to be rice production, especially in the context of a subsistence economy. Per capita rice production per day in Prey Veng was 1.91 kg, compared to 0.58 kg and 0.34 kg in Kompong Speu and Kandal. Significant numbers of people did not produce any rice at all in 1996–97: 10 percent in Prey Veng and Kompong Speu, 48 percent in Kandal. Among rice-producing households, large variations were observed across socio-economic categories. Thus, annual production per capita in Prey Veng

[3] By way of standardisation, an adult male unit equivalency was estimated to establish household size. Weights attached were as follows: adult male = 1.0, adult female = 0.8 and child (aged under 12 years) = 0.5.

[4] Rice consumption also does not seem to be sensitive to seasonal price fluctuations. Usually, the high price months for rice are September–October (700–800 riels per kg in 1996), coinciding approximately with the first round survey.

[5] For example, one source assumes that rice accounts for 68 percent of calorie intake in rural Cambodia (FAO 1996).

Figure 3.1. Rice Calories per Adult Unit Equivalent (all areas, second round)



ranged from 489 kg (very poor) to 1,554 kg (well-off). Similarly, in Kompong Speu, the variation was between 41 kg and 358 kg, and for Kandal 261 kg to 375 kg (see Appendix Three). In other words, availability from rice production varied enormously across regions, households and socio-economic groups. Rice consumption, as already noted, is fairly stable by season, location or socio-economic position. The point to note here is the obvious dependence on the market for supplies of basic foods for very significant proportions of the people.

Consumption of Non-Rice Foods

Rice is the staple food in Cambodia. It is nevertheless likely that the Cambodian diet is considerably diversified because of significant access to common property resources that provide vital supplementary incomes in kind (mostly fuel and food). This impression is reinforced by estimates of food availability from FAO, which show that per capita availability of animal fats and products compares favourably with that of other countries in the region (FAO 1996).[6] Similarly, a household expenditure survey for 1993–94 reports that rice accounts for only 15 percent of total food expenditures in rural areas (NIS 1995), suggesting high consumption of non-rice foods.

Our data show that the calorie contribution of animal products ranges from 15 to 17 percent of total calorie intake, while the contribution of non-rice vegetative products (including roots and tubers) is small. In terms of regional differences, the better access of Kandal to aquatic resources has resulted in more calories from this source, while Kompong Speu shows a lower consumption of rice. Regional price differences are also to be noted, with prices in Prey Veng generally lowest and those in Kompong Speu highest.[7] This has resulted in more expensive calories per riel in Kompong Speu. Thus, even though rice accounts for around 38 to 50 percent of the food budget, its contribution in terms of calories is much higher, as already noted.[8]

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[6] Calorie availability from rice is reported at 1,572 calories, from other vegetables at 180 calories, and from animal products 601 calories (per capita daily intake, 1989–91) (FAO 1996:189).

[7] Average prices (actual) were estimated excluding a 5-percent trim to remove any outliers. This resulted in the following prices: 1,862, 1,993 and 961 riels per kg for fish in Prey Veng, Kompong Speu and Kandal; 457, 569 and 613 riels per kg for vegetables (typified by gourds or yams).

[8] It may be observed that these figures do not agree well with other available data, such as FAO (1996) and NIS (1995).

Table 3.2. Calorie Consumption and Food Expenditure (per adult unit)

Calorie source	Prey Veng		Kompong Speu		Kandal	
	Calories	Riels	Calories	Riels	Calories	Riels
Rice	1,876	288	1,809	322	1,776	328
Vegetable products	70	107	51	95	47	97
Fish paste, etc.	21	277 [a]	30	341 [a]	15	189 [a]
Oils and fats	168	59	26	81	30	45
Meat and fish	208	-	235	-	290	-
Total	2,343	764	2,151	840	2,158	660
Calories per riel	3.0	-	2.4	-	3.2	-
Rice as a percentage of total	80.0	37.7	84.1	38.3	82.3	49.8

Note: Calories for non-rice products were estimated from values deflated by price of the dominant product in each group (e.g. fish in "meat and fish," pork fat under "oils and fats") and multiplied by standard conversion factors. a Includes all animal products and derivatives.

Non-rice food expenditures and calories reveal much greater variation compared with rice calories and expenditures. However, the picture is not quite straightforward. The variation in non-rice calories and expenditures is different in all three areas. In Prey Veng, non-rice calorie intake is systematically higher for richer groups, while in Kandal, the richest and the poorest have the highest level of non-rice calorie intake per adult unit. Kompong Speu provides a third dimension; here we find an inverse relationship between class categories and non-rice calories![9] Although the Prey Veng situation accords well with intuitive reasoning, this works less well for Kandal and not at all for Kompong Speu. The explanation lies not in calories but in their composition. Expenditure patterns reveal that the source of non-rice calories are different for the rich and the poor. In other words, the rich obtain much more expensive calories, so that the value of their non-rice foods is higher. Thus, the basic distinguishing feature between the better-off and the poor is the lower consumption of rice and greater consumption of more expensive non-rice foods by the wealthier.

Purchase versus Subsistence

Quite substantial market participation is to be noted, even for basic foods. In Prey Veng and Kompong Speu, 24 and 29 percent of the rice consumed was purchased. The figure for Kandal was over 90 percent, showing the relatively small role of self-produced rice here, especially just before the harvest. For non-rice foods, the proportions purchased were found to be 62, 54 and 50 percent for Prey Veng, Kompong Speu and Kandal. In other words, there is significant consumption dependence (of up to 50 percent) on either home-produced food or on food obtained from hunting and gathering or exchange. Does this vary over the socio-economic spectrum? The broad picture that emerges is that the proportion of purchases is high for the richest group (80 to 90 percent). For all others, it is evenly spread, implying that reliance on non-purchased foods is not limited to the poor.[10]

Adequacy of Calories

Given the evidence on consumption of rice and non-rice foods and estimates of their calorie-equivalence, (which, even at the best of times, remains a hazardous exercise) what can be said in terms of the adequacy of the diet of the rural Cambodian population? This is an extremely difficult question. Individual and household calorie needs vary enormously even for similar socio-economic groups. In addition, there are problems relating to population structure, seasonalities, the incidence of illnesses and so on. Some authors also contend that it is quite possible for populations to adapt well to a low level of calorie intake for indefinite periods

[9] See Appendix Three.

[10] Taking all households together, the ratio of purchases to total non-rice foods is 77 percent for the rich, varying between 54 and 62 percent for the other groups. No systematic pattern emerges.

without displaying any unusual symptoms of deprivation.[11] Although the use of a readily available index (such as the widely used FAO norm of 2,100 calories per capita) is understandable, this requires considerable caution.

Our data reveal the lack of a systematic and clear difference in total calorie consumption across social groups. Thus in Kompong Speu, calorie intake is not sensitive to class. In Prey Veng and Kandal, the middle ranges are virtually indistinguishable from one another, despite a clear difference between the extremes. This suggests that a static estimate of calorie intake may not be a good indicator of poverty in the Cambodian context, and may well confound poverty measures based on food-energy norms. One solution may be to look at calorie composition, but even this can be difficult, as is borne out by the Kompong Speu experience. It is far more important to focus on the different ways (and associated costs) in which different social groups are able to address their calorie requirements.

Further, it seems more appropriate to base energy norms in terms of adult consumption unit equivalents rather than on per capita terms, given the sharp differences in population structures that may be encountered. Our data suggest that use of a per capita calorie norm of 2,100 calories would mean that virtually everyone is poor in Prey Veng, that strata 4,5 and 6 (the better-off groups) are "poor" in Kompong Speu, and that even the mid-strata are unable to meet the norm in Kandal—clearly an implausible situation.

On the question of adequacy, we suggest that the lack of calorie intake variation across classes (accompanied by significant expenditure differentials) indicates that calorie intakes are stable in terms of socio-culturally determined norms.

Non-Food Consumption

Non-food expenditures incurred by households on education, health, transport and clothing point to the importance of health expenditures, which alone account for between 50 and 60 percent of all non-food expenditures. If food expenditures are included, health costs still remain significant at around 15 percent. Overall, non-food expenditures constitute between 22 percent (Kandal) and 34 percent (Kompong Speu) of total household expenditures.

Table 3.3. Non-Food Consumption of Households in Three Villages (riels per month)

	Prey Veng (surplus)	Kompong Speu (deficit)	Kandal (fishing)
Education	2,840	1,267	2,847
Health[a]	14,700	14,446	15,577
	(54.1)	(48.2)	(61.4)
Clothing	1,281	4,870	2,241
Entertainment	-	1,117	218
Transport	270	-	-
Ceremonies	3,674	7,615	1,869
Other	4,380	5,542	2,600
Total non-food	27,145	29,987	25,352
Total	88,664	87,114	115,717
Non-food as % of total	30.6	34.4	22.0

a Figures in parentheses are percentages of non-food expenditure.

All groups spend heavily on health. However, the incidence of health expenditures appears to fall disproportionately on the poor. Both in absolute terms and as a proportion of total expenditures, the poor tend to incur heavier expenditures on health. Due to the high weight of

[11] See Harriss (1994) for a good discussion of some of these issues. See also Sukhatme (1982), Seckler (1982) and Pacey & Payne (1985).

health expenditures in total non-food costs of the poor, overall non-food expenses also tend to be relatively high for this group.

Anthropometric Evidence

Data on anthropometric measures were taken from all children aged under five in the sample households during the second round. A total of 206 children (111 male and 95 female) were covered from all three areas.[12] These measures have gained in popularity because of the ease with which the required data can be collected and analysed. Although rather cut and dry, these data can serve to focus on an additional dimension of food security, namely the health and nutritional status of children. It is assumed that the anthropometric status of children would approximate the food security level of the households from which they come.

The anthropometric approach is of course not without its critics, who point to the diverse factors (not necessarily related to food) that affect measures like height and weight, as well as to the sensitivity of the measures to small errors in measurements.[13] Despite these shortcomings, the approach is still expected to throw light on a dimension of considerable interest.

The data collected allow us to relate weight and height with age, so that the associated "Z-scores" can be computed.[14] The weight-for-age index shows what is called protein-energy malnutrition (PEM), while height-for-age is a proxy for stunting. Height-for-weight (wasting) is also sometimes used, though its interpretation is less straightforward. Both the proxies for stunting and wasting are extremely sensitive to measurement errors.[15] It is therefore the preferred practice to focus on weight-for-age Z-scores (WAZ).

Conventional cut-off points used for mild, moderate and severe malnutrition are WAZs of -2 to -1, -3 to -2 and less than -3 respectively. The incidence of moderate and severe malnutrition is reported below.

Table 3.4. Incidence of Mild to Severe Malnutrition in Children Aged Under 5 Years (percent)

WAZ	Prey Veng	Kompong Speu	Kandal	UNICEF study
Moderate	39.2	51.9	39.7	35.0
Severe	12.9	16.6	29.4	21.7

The incidence of severe malnutrition is significant, reaching almost 30 percent in Kandal. Moderate malnutrition affects around 40 percent of children in Prey Veng and Kandal, rising to 52 percent in Kompong Speu.

The inter-area disparity in the status of nutrition of children as borne out by the anthropometric study is indicative of the complex forces that govern nutrition. On the one hand, the superiority of the rice surplus area is borne out, and on the other, it begs the question of the factors behind malnutrition in a situation where calorie consumption is roughly similar.

Gender and Class

Given the sample size, it would not be advisable to look into gender and class differences for each area separately. Gender differences (for the entire sample) appear to be small, with severe malnutrition at 17 percent for both boys and girls, and the incidence of moderate malnu-

[12] Seventy-four children in Prey Veng; 56 in Kompong Speu and 57 in Kandal.

[13] See Sen (1985:83), Pacey & Payne (1985).

[14] Z-scores are essentially standard deviations from a given norm which enable us to compare a given distribution of, for example, weight for age against the ideal or desirable norm.

[15] Such measurements are typically carried out in non-ideal conditions.

trition somewhat higher for boys.[16] In terms of class, the incidence of severe malnutrition appears to be markedly less among children from better-off households. Moderate malnutrition, however, does not appear to be sensitive to class, implying that non-food factors are important.

Table 3.5. Incidence of Malnutrition by Gender and Class (WAZ)

Class / gender	WAZ less than -3 (children)	WAZ -3 to -2 (children)	Total in class (children)	Moderate malnutrition (%)	Severe malnutrition (%)
Rich	0	3	11	27.2	0.0
Well-off	6	7	47	14.9	12.8
Marginal (positive)	12	10	56	17.9	21.4
Marginal (negative)	2	7	24	29.2	8.3
Poor	9	10	44	22.7	20.4
Very poor	6	6	24	25.0	25.0
Male	19	25	112	22.3	16.9
Female	17	17	95	17.9	17.9

2) The Extent of Poverty

The evidence discussed so far has been static and has tried to answer the question of adequacy of calorie intake and nutritional levels in rural Cambodia. A distinct lack of variability in calorie consumption (across regions and classes) was found to co-exist with significant differences in the consumption of non-rice foods, as well as in nutritional standards as reflected in the anthropometric estimates. This brings us to an important estimation problem. Under the circumstances, can we use a calorie-based norm to define poverty levels? The answer would appear to be negative. A far better approach may be to use asset and capital ownership, including availability of family labour. Food security is not a static condition. Its significance lies in the processes and dynamics that enable people to achieve their calorie intake levels, rather than simply being what they consume at a given point in time. Thus it is not so much what people eat but what they have to do so that they are able to eat. By disaggregating our households into socio-economic classes, we have implicitly focused on processes by looking at assets, resources and capital.

The household classification data, in conjunction with the anthropometric data and with our field observations and discussions with key informants, lead us to believe that there is significant rural poverty. We identified 10 households in Prey Veng, 27 in Kandal and 23 in Kompong Speu (10, 37 and 34 percent of households surveyed) that may be described as poor or very poor. About half of these were in a situation of food insecurity, being chronically short of food, heavily dependent on consumption loans and credit, relying almost entirely on their labour, especially female labour, and with few or no assets and no rice stocks. Distress behaviour for this group included temporary migration (to the forests or to urban areas), animal or asset sales and share-in arrangements for animals. Consumption of distress foods were also reported from this group, though the incidence appeared to be small.[17]

The basic point to note is that there are large groups of people (i.e. those belonging to classes 1 to 3 in our scheme) who are currently consuming at reasonable levels in terms of calories, but who nevertheless can find themselves in serious danger in the event of a personal or community emergency.

[16] These differences are not significant statistically.

[17] A total of 22 households (6, 5 and 11 from Kompong Speu, Prey Veng and Kandal) were observed to consume distress foods such as rice mixed with cassava, yam or maize, or soup made out of collected vegetables such as sesbania and rice.

A Calorie-Based Estimate of Poverty

Poverty estimates are frequently carried out using household expenditure surveys, with the poverty line defined in terms of a calorie norm. For example such a norm might be per capita consumption of 2,100 calories plus 58 grams of protein (see Rahman *et al.* 1996). Since data on actual consumption is rarely available (let alone estimates of observed food and calorie intake), the practice is to arrive at a consumption basket that will provide the indicated calorie/protein value and then convert this into monetary terms (using appropriate prices). Since even poor families have certain minimum non-food expenses, a certain proportion (typically 20–30 percent) is added on to arrive at the poverty line. This poverty line income is then judged against independently derived estimates of income or expenditures. It is not difficult to see that there are numerous potential pitfalls at each step of this route, given the number of assumptions needed. According to this definition, "poor" means someone who can "afford" the minimum consumption basket but who may not necessarily be consuming at that level.

Since we have direct estimates of consumption of different foods and are able to arrive at calorie estimates, it would be preferable to estimate poverty directly, in terms of people who are actually consuming less than the required calories. It has been noted already that calories appear not to be sensitive to socio-economic class, so that it is not certain what such an exercise would actually reveal. This is an interesting case that will need to be further discussed and debated. An alternative estimate is also provided using the more traditional, income-based approach.

Two Estimates of Poverty

Direct calorie-based estimate

The assumptions are:

1. A poverty line standing at 2,200 calories per adult unit (this is 80 percent of the FAO-recommended norm of 2,700 calories per adult male).
2. Allowing a calorie under-estimation error of 10 percent across all households.[18]

Alternative estimate based on income

An attempt was made to estimate a poverty line income, using a calorie norm of 2,200 calories per adult unit. Average prices were estimated for rice (actually paid), fish (all fish actually purchased) and "vegetables" using the prices for the main vegetables consumed. The data on calorie shares by source (rice, fish, etc.) were used as weights to arrive at a price for calories, for each village separately. These prices were then used to convert the poverty line in calories to riels. It was assumed that 20 percent of expenditures of the poor would be on non-food goods (the actual figure varies from 22 to 40 percent), thus enabling us to arrive at the poverty line income of :

Prey Veng: 880 riels per adult unit per day;
Kompong Speu: 1,100 riels per adult unit per day;
Kandal: 826 riels per adult unit per day.

Our income estimates were reached by aggregating all sub-components of income: agriculture, labour earnings, non-agriculture, etc. (including an imputed value for gathered items).

[18] Calorie or nutritional estimation problems are complex in both recall methods and weighing methods. Discrepancies of 10 to 40 percent have been reported, with errors stemming from trade-offs between precision, cost and invasiveness.

Measures

Three measures of poverty were used: the head-count index (H), the poverty gap index (PG) and the severity of poverty index (P2). H is the simplest, and merely indicates what proportion of households or population are below the poverty line. PG, in addition to this, focuses on the deviation of incomes, calories, etc. from the poverty line, while P2 (also known as the Forster-Greer-Thorbecke Index) explicitly accounts for the distribution of consumption below the poverty line.[19]

Thus:

$H = q / n$ (proportion of the total population deemed to be poor), where q is the number of poor people and n the total population.

$PG = 1 / n \; \Sigma [z - yi / z]$ (mean proportionate poverty gap across the whole population—zero gap for the non-poor), where z is the poverty line, yi is consumption level of the ith poor ($i = 1, 2..., q$), and Σ is the sum over 1 to q.

$P2 = 1 / n \; \Sigma [z - yi / z]^2$ or $P2 = PG^2 / H + (H-PG)^2 / H \cdot CV_p^2$

Table 3.6. Poverty Estimates (percentage of households)

	H	PG	P2
Prey Veng (surplus)	37.0	5.0	1.0
	43.0	16.0	55.0
Kompong Speu (deficit)	47.0	8.0	2.0
	50.0	16.0	80.0
Kandal (fishing)	48.0	6.0	1.0
	48.0	18.0	30.0

Note: Row 1 = calorie-based direct estimate; row 2 = income-based direct estimate

Unfortunately, estimates of poverty for Cambodia are scarce. Recent estimates using national household expenditure data puts H between 35 and 39 percent. Estimates of PG and P2 have also been generated (UNDP 1997). Although our estimates of H appear "reasonable" and correspond to current notions of poverty in the country, PG and P2 seem to vary enormously. Interpretation of H is also problematic. As Harriss (1994) points out, if we assume some cut-off point, then clearly a certain proportion of the distribution will fall below this. If this cut-off is at or near the mean of the distribution, and if the distribution is approximately normal, around half of the observations will fall below the mean.[20]

If we have to choose between the alternative estimates, we would be happier with the first, direct estimate. The limitation here is that it relates to calorie consumption for one day. The alternative, income-based estimate is better from this point of view but suffers from the difficulty of putting a monetary value to large, non-monetarised income flows as well as to the fact that assumed calorie prices may be not be static but subject to significant seasonal change. There is some comfort in the fact that estimates of H at least are roughly comparable for both methods.[21]

[19] For an excellent discussion of these poverty measures and their properties see Rahman *et al.* (1996).

[20] See Sen (1995).

[21] It may be of interest to compare these with alternative, more subjective estimates derived from the household classification exercise and from responses of key informants. These are reported in Appendix Three.

Other Indicators of Consumption and Nutrition
The study has generated data on a number of other indicators that have a bearing, directly or indirectly, on consumption and nutrition. These include information on rice and other food stocks, the marketed amounts of rice by surplus and deficit households, food consumption frequency, symptoms of malnutrition or distress behaviour, and so on. These provide important additional insights into aspects of food security (see Appendix Three).

3) Conclusion

To sum up the findings of this chapter:

1. Calorie intake does not appear to be sensitive to class. In other words, the variation in calorie intake within classes is greater than between classes, *i.e.* socio-economic class is not a good predicator of calories. Food expenditure, however, is sensitive to class, suggesting that it is not the level of calories but the calorie mix that differentiates the food consumption of the rich from the less well-off.
2. The contribution of rice to total calories is "excessive" and is higher than is commonly assumed.
3. Among items of non-food consumption, the most critical is health. The impact of health-related expenditures falls disproportionately on the poor.
4. The incidence of severe malnutrition is low. However, mild to moderate malnutrition is widespread, and appears to be broadly sensitive to area and class, but not to gender.
5. The calorie-based estimates of poverty are difficult to interpret, given their lack of sensitivity to class. An income-based estimate is conceptually better but suffers from various drawbacks. It is perhaps fortuitous that H (the head-count index) is approximately similar for both measures, though the other indices are not. Taking on board the diverse body of evidence presented in this chapter, it is clear that despite considerable spatial variation, there is significant rural poverty, ranging from around at least 10 percent of households to perhaps as high as 40 percent or more.

Chapter Four

The Structure of Income

From the point of view of food security, it is crucial to understand the structure and level of household incomes and their distribution over seasons and across classes. There is an implicit assumption that rural incomes are undiversified and narrowly based on rice production and processing activities. Superimposed on this "fact" is the proverbial volatility of rice yields in Cambodia, in part due to flooding and drought, but also due to poor quality soils and lack of irrigation in many parts of the country. Thus, it is believed that the heavy dependence on rice, combined with high levels of yield risks, is an important if not the main factor behind income instability and food insecurity in rural Cambodia. We argue in this chapter that these popular impressions need to be carefully reviewed.

A necessary first step is to arrive at estimates of income by seasons and sources. There are, however, a number of complications, both conceptual and operational, that make income estimation in a traditional, subsistence-oriented, partially commercialised economy rather hazardous. We have defined income in terms of net inflows in cash or kind per month, with the latter converted to money using market prices. At the conceptual level, the problem relates to what items should be included, *i.e.* owner-occupied housing, items "borrowed" but not repaid, interest earned from informal lending, and so on. At the empirical level, the main problems relate to the validity of recall methods to estimate income, the appropriateness of prices used to convert kind into cash (especially in the context of poorly developed or non-existent markets), and so forth. The approach adopted was to identify sources of income and then attempt estimates. Owner-occupied housing was omitted on the grounds that opportunity costs were close to zero. The difficulties relating to estimating interest earnings also precluded any attempts to capture this dimension. Prices used for conversion were based on the responses of the respondents themselves.

1) Levels and Sources

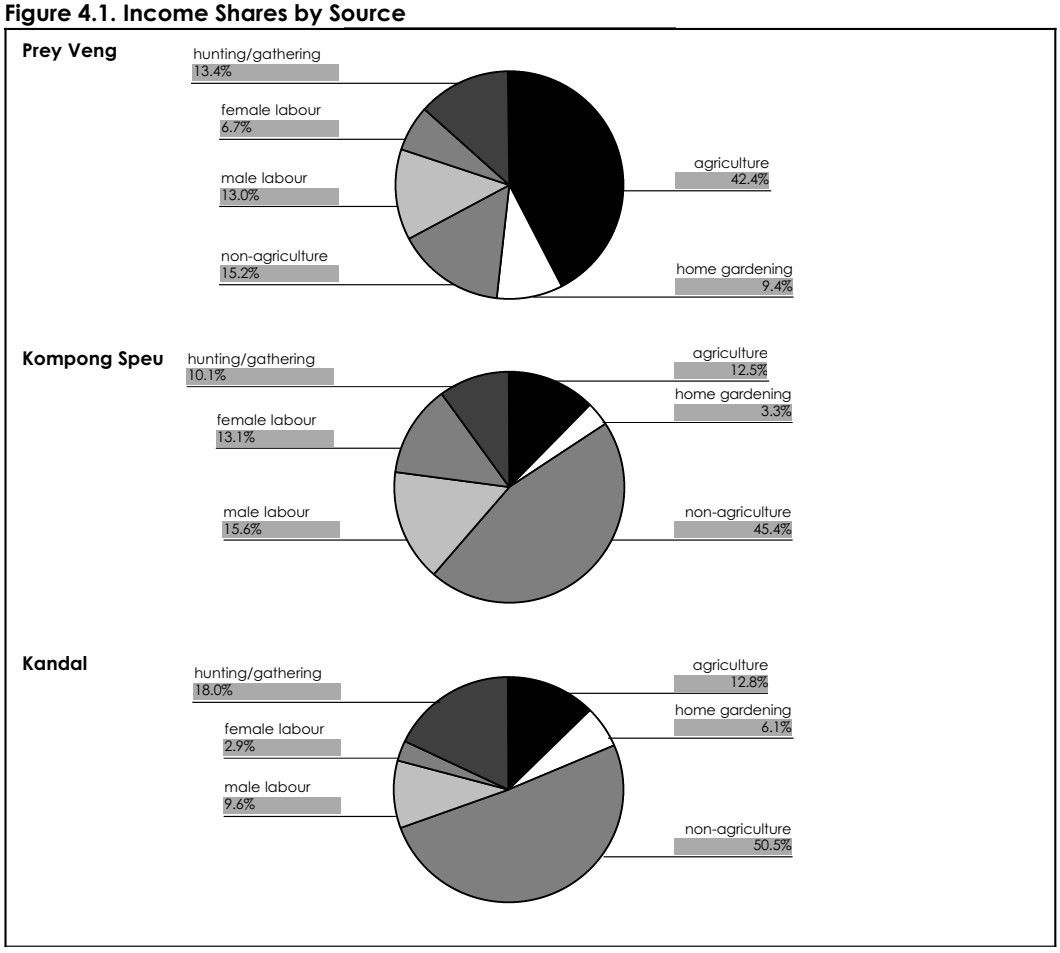
Estimates of net income per household per month range from $40 to $54. The main sources are agricultural income, income from home garden production, non-agricultural income, labour earnings and in-flows in kind from hunting and gathering. Their relative importance is brought out in Table 4.1 overleaf.

Estimates of household income or income per adult unit appear to be somewhat lower than those generated elsewhere, as a result of differences in the way that income has been defined by different investigators. Although levels are of some importance, it is much more interesting to examine income composition and relative shares, and here we are faced with evidence that challenges existing perceptions.

Table 4.1. Monthly Income by Source (riels)

	Prey Veng	Kompong Speu	Kandal
Agricultural income	61,500	13,500	18,400
Home gardening	13,600	3,600	8,800
Non-agricultural income	22,100	49,000	72,300
Male labour	18,900	16,800	13,800
Female labour	9,700	14,100	4,200
Hunting and gathering	19,400	10,900	25,800
Income per adult unit (inc. gath.)	39,500	29,800	35,700
Income per household (inc. gath.)	145,200	108,000	143,300
Income per household (in dollars)	53.80	40.00	53.00

Figure 4.1. Income Shares by Source



The relative importance of agriculture (even if home garden production is included) varies dramatically across the three study villages. In Prey Veng, agriculture accounts for the dominant share of total income (over 50 percent, if home garden production is included). This is followed by labour earnings (from both agricultural and non-agricultural work), non-agricultural income, and income in kind from gathering and hunting activities. The last is a significant source of residual income, demonstrated by the fact that its contribution is as large as that of male labour earnings.

In Kompong Speu and Kandal, the share of agricultural (crop) sources of income is much smaller. In Kompong Speu, its share is less than 16 percent (including home garden production) which is only marginally higher than hunting/gathering and lower than the contribution of female labour earnings. By contrast, non-agricultural activities (mainly processing, trade

and transport) account for around 45 percent of total income. A similar pattern is evident in Kandal, with non-agricultural shares at around 50 percent and the share of agriculture and hunting/gathering at similar levels of 18–19 percent.

Thus, the role of agriculture as a source of income is highly variable. Even in a place like Prey Veng, where rice production is extremely important, it accounts for only half of total income, while in Kompong Speu and Kandal it can at best be described as a minor contributor. On the other hand, the significance of hunting/gathering is great, and is likely to be even greater for poorer households.

2) Seasonal Fluctuations

The stability of income is of crucial importance for poor rural households, as smoothing mechanisms such as credit and stock-holding are costly. Both year-to-year and within-year fluctuations can pose problems. Unfortunately, our data relate to two points in time within the same year, and can thus only be used to assess the degree of seasonal fluctuations in income. This evidence is adduced below. Agricultural and home garden incomes have not been included in this exercise, since the bulk of these are annual in nature in Cambodia, where mono-cropping is the norm.

Labour earnings, especially from male labour, appear to be the least volatile. Non-agricultural earnings display sharp seasonal variation, but the most volatile category is clearly hunting/gathering. In general, the message of Table 4.2 is that rural incomes are subject to sharp seasonalities which need to be offset by appropriate responses in savings, credit or indeed through participation in labour markets.

Table 4.2. Seasonal Fluctuations in Non-Agricultural Incomes (percentage)

	Prey Veng	Kompong Speu	Kandal
Non-agriculture	+33.3	-81.2	-34.9
Male labour	+18.0	no change	negligible change
Female labour	no change	+28.5	+33.3
Hunting/gathering	+121.0	-95.5	+86.7

Note: + denotes an increase from round 1 and - a decrease; round 1 was September–October 1996, round 2 was February–April 1997

3) Income Composition and Distribution

Cambodia has been under different socialist regimes for many years, during which time private property was abolished and the economy centrally controlled. Private ownership of land began to be re-introduced in the late 1980s with the initiation of a land redistribution programme—a process that appears to have been substantially completed by 1992. Cambodia is also blessed with rich natural resources, including forests and fisheries. There is thus an impression of resource abundance and relatively well-distributed assets and incomes across the country.

Reference to the charts in Appendix Four, however, shows the sharp difference in the distribution of agricultural (crop) incomes in all three areas. Non-agricultural incomes are important for Kandal and Kompong Speu. In Kandal, these appear to be well-distributed across class groups (though the poorest are clearly at a great disadvantage), but distribution remains adverse in the Kompong Speu. Similarly, home garden or non-agricultural incomes in Prey Veng reveal significant inequality.

It is only when we turn to labour incomes and gathering sources that we note a reversal of these tendencies. Relatively speaking, gathering activities are more important for the poor,

though it is by no means the case that better-off groups do not benefit from them. In Kompong Speu, the poor appear to have less access to this important source of income (due to lack of oxcarts needed to go into the forest to collect firewood), while in Prey Veng class differences in this respect appear small. It is only in Kandal where the poorest appear to depend critically on access to common property resources (in this case open or semi-open access to water bodies).

Labour incomes are truly the "monopoly" of the poor, especially poor women, whose participation in the labour market is high. Differences between male- and female-headed households are broadly consistent across sectors, with income levels of male-headed households higher than those of female-headed households. In Kompong Speu, we find a slight deviation from this pattern, with female-headed households depending more heavily on labour incomes and gathering activities.

4) Discussion

The vision of a traditional, stagnant rural Cambodia heavily dependent on agriculture, especially on rice cultivation, is misleading. Although rice is important and productivity is poor, there are areas such as that studied in Prey Veng, where adoption of modern cultivation methods has spread rapidly. One cannot help but be impressed by the sense of rural dynamism that is evident in a place such as Prey Veng, where tractors, power tillers, irrigation machines and automatic threshers are to be seen everywhere. The rise in prosperity is reflected in the number of motorcycles, television sets, battery charging shops and rice mills.

By contrast, people in places like Kompong Speu face severe difficulties. The area is drought-prone, imparting a high level of risk to the paddy crop. This in turn means that the people have to depend on a host of non-agricultural pursuits (including food processing, retailing, firewood gathering, seasonal migration, etc.) in order to eke out an existence.

The position of Kandal is somewhere between the two. HYV rice adoption is in its early stages and is not as widespread as it is in Prey Veng. This village is primarily dependent on fishing, which is a highly seasonal activity. However, access to water bodies is being increasingly restricted, forcing poor fishermen to look at other income opportunities.

Despite considerable differences in sources, levels and the distribution of income, some things stand out clearly. Income inequalities are sharp and this is particularly true of agricultural incomes. To some extent this is offset by earnings from the labour market. For the poor, the role of women in the labour market is particularly striking. The other major feature that was seen relates to the role of hunting/gathering activities and access to common property resources. All classes of people were found to have access to common property resources, which are a significant source of income, especially for the poor. However, important changes are underway that will tend to restrict access. Much of the extractive activities in the forests are "illegal" in nature, requiring the payment of bribes to guards in addition to the risks faced from land mines, malaria and fever. It is thus the most desperate who will choose this option (as was widely seen in Kompong Speu). Leasing of water bodies to powerful business interests and ever increasing restrictions on free access to fisheries is already evident in places like Kandal, where the poorest depend most on hunting/gathering for their livelihoods. What we observe is a precarious balance in terms of sustaining livelihoods and trends that appear to have potentially adverse consequences for the poor.

Chapter Five

The Distribution of Assets

Private property was reintroduced to Cambodia in the late 1980s. This took the form of a broad-based land redistribution programme, along with the opening up of the economy to market forces. Thus, from a heavily controlled command economy structure, the country has moved into what may be described as a brash example of an unbridled market economy, with none of the usual institutions of the market that underpin efficient and smooth conduct.[1]

Despite fairly comprehensive land reform, significant problems remain. These include groups that were left out of the redistribution, the failure to issue land titles to many people, land-related conflicts, and so on. Large tracts of the country, including some of the most fertile areas, have been left out of the redistribution programme due to the dangers posed by land mines and continuing insurgency. Despite these problems, most households appear to have access to land, and indeed many have been able to expand their asset base through clearing additional land—an option that is becoming more and more difficult. The commoditisation of land, on the other hand, means that market forces are now operating in addition to normal demographic forces that cause land to be transferred, exchanged or lost. Ownership of land in an agrarian economy is crucial and is a fundamental determinant of income and wealth. The relative abundance of land in Cambodia draws attention to other aspects, such as land quality, availability of labour, access to irrigation and draught animal power.

1) Asset Ownership

Ownership of assets such as land, animals, transport and machinery is reported below by area and type of household head. Female-headed households are found to be at a distinct disadvantage. Thus, average land ownership across all households is 1.45 hectares, 0.81 hectares and 0.79 hectares in Prey Veng, Kompong Speu and Kandal, while for female-headed households, the average rates are 0.98, 0.36 and 0.11 hectares. Similarly, the value of other assets such as animals or transport are highly inequitably distributed as between male and female-headed households.

Table 5.1 overleaf illustrates the overall superiority of Prey Veng over the other areas in terms of its asset position. The position of Kompong Speu and Kandal appears similar, with Kandal appearing to enjoy an edge over Kompong Speu for two reasons: 1) better agricultural potential due to the availability of surface water for irrigation and because the area is not drought-prone; and 2) superior endowment in terms of common property resources (at least for the time being) in the form of surface water, fish and other aquatic resources.

[1] These include an extremely weak financial infrastructure, the absence of regulatory bodies and a weak and corrupt political and judicial administration.

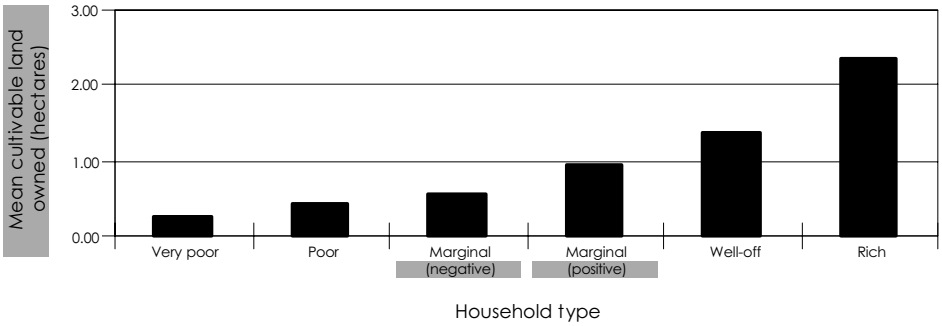
Table 5.1. Asset Ownership Status by Area and Male- and Female-Headed Households

	Prey Veng	Kompong Speu	Kandal
Land (hectares)			
Male	1.45	0.81	0.79
Female	0.98	0.36	0.11
Animals (value)[a]			
Male	797,000	913,000	414,000
Female	481,000	231,000	77,000
Transport (value)[a]			
Male	517,000	205,000	413,000
Female	263,000	45,000	61,000
Machinery (value)[a]			
Male	1,001,000	66,000	47,000
Female	356,000	-	-
Durables (value)[a]			
Male	180,000	52,000	70,000
Female	18,300	33,000	negligible

a Value of non-land assets given in riels; male and female refers to the gender of the head of the household

The inequality in both agricultural and non-agricultural incomes observed in Chapter Four is mirrored by the distribution of assets. It is somewhat strange to observe that land is inequitably distributed despite recent land reforms. Since land was distributed on the basis of the number of work units per household, we examined the distribution both in terms of per household as well as in terms of per adult unit. Irrespective of the unit of account, wide differences are noted between the poor and non-poor households. The top 10 percent of households were found to hold 33 percent of the land, while the bottom 20 percent had less than 4 percent. This pattern of distribution is more reminiscent of South Asia than East Asia. The picture of inequality does not vary much across the three areas. In Prey Veng and Kompong Speu, inequalities are similar, while in Kandal asset distribution appears more favourable.

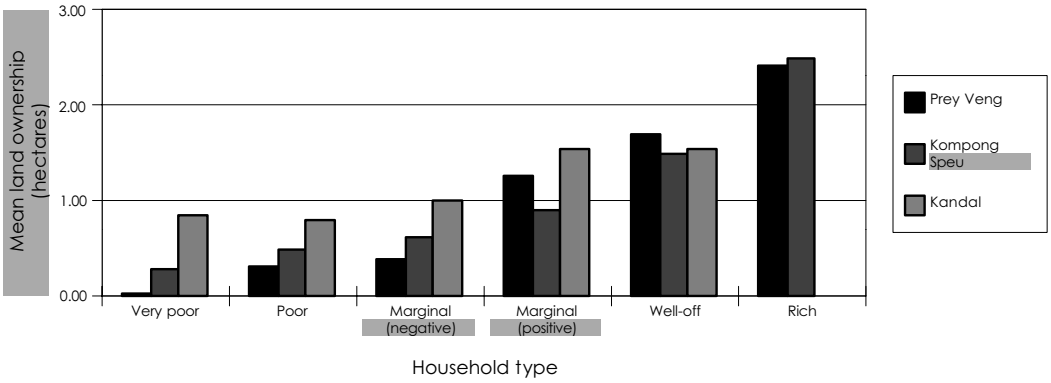
Figure 5.1. Cultivable Land Owned by Class (all three villages)



Animals are an important source of wealth in rural Cambodia, second in importance to land. Animals are used for a variety of purposes including draught power and transportation (oxen) as well as being a source of income through fattening and trade (pigs and poultry). Thus, it would be instructive to examine the distribution of animal wealth in our sample households, and in particular to see if the poorer social groups are able to compensate for their relative lack of access to land through greater animal ownership.

A look at the charts in Appendix Five reveals that inequalities in ownership of animal stocks are, if anything, even greater than in land. This is revealed by the high Gini ratio (0.50

Figure 5.2. Household Land Ownership by Class (three villages)



compared to 0.47 for cultivated land) as well as by the fact that the bottom 20 percent of households owned only 0.4 percent of the animal wealth, while the top 10 percent owned over 30 percent.

Animal raising appears to be hazardous, especially pigs (the preferred activity in this sector) as a result of high mortality rates. Only better-off households or those with plenty of excess labour are found to be engaged in pig-raising and trading (McAndrew 1998).

Other assets were also examined, including transport and machinery, capital goods and consumer durables. In every case, distribution was found to be even more adverse than in the case of land. In other words, the inequality in land ownership that we found is not offset by a better distribution in other types of assets, suggesting that land and other asset ownership probably go hand in hand.

Table 5.2. Rural Distribution of Assets and Income

	Share of bottom 20%	Share of top 10%	Gini ratio
Land (cultivated)	3.7	33.0	0.47
Animals	0.4	30.4	0.50
Transportation	2.3	46.0	0.61
Machinery	6.9	36.3	0.49
Durables	1.6	47.1	0.65
Income per adult unit	10.0	25.0	0.33

Chapter Six

Rice Production, Prices and Marketed Surplus

Agriculture accounts for half of Cambodia's gross domestic product (GDP) and employs about 75 percent of the labour force. Rice is the most important crop, contributing a third of the total value of agricultural production while occupying 90 percent of the cultivated land. Rice production has increased at an impressive annual rate of over 11 percent since 1979 (UNDP 1997). Cambodia is thus broadly self-sufficient, at least in years of good harvest.[1] However, this need not automatically translate into food security at the household level.

Rice has many uses in rural Cambodia, and not just the obvious one of providing calories. Households, even urban ones, prefer to have sufficient rice in stock as a security precaution. It is used as quasi-money to pay for labour or services, as credit and in various barter arrangements. It is used to make wine, cakes and noodles—important processing and retailing activities in rural areas. The importance of rice goes beyond the economic to the cultural and psychological spheres. Rice occupied a central place in the "back to fundamentals" policy adopted by the Khmer Rouge in the 1970s. Everyone had to take part in rice cultivation, and ultimately it was an acute rice scarcity that led to famine and mass starvation at the time. Yet at the household level, the direct role of rice cultivation is of lesser significance than that popularly attributed to it. This chapter explores some of the broad features of the household rice economy: participation, productivity, returns, marketed surplus and prices.

1) Participation and Productivity

Average paddy yields in the study villages were found to be slightly higher than the national average, estimated at 3.69 tons and 3.33 tons per hectare in the two irrigated/flood-recession rice villages of Prey Veng and Kandal, where high-yielding varieties (HYV) of rice are predominant. In the traditional, rain-fed village (Kompong Speu), yields were as expected much lower, at 1.86 tons per hectare. Household participation in rice cultivation ranges from close to 90 percent in both Prey Veng and Kompong Speu areas to about 50 percent in the fishing village (Kandal). However, participation rates tend to be lower for poorer households, while at the same time their yields tend to be higher. This pattern is especially marked in the case of traditional, non-irrigated rice. This suggests that poorer households with limited access to rice land tend to use more intensive tillage practices. In other words, there may well be an inverse relationship between farm-size and productivity that has been noted elsewhere.[2]

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[1] A bumper harvest in 1995/96 yielded a rice surplus of 225,000 tons (FAO/WFP 1996). Cambodian agriculture remains largely traditional and subject to strong year-to-year production fluctuations.

[2] This appears to suggest the existence of an inverse relationship between farm-size and productivity (actually poverty level and productivity) for Cambodian agriculture.

Table 6.1. Paddy Rice Yields by Village and Class (kg per hectare)

	Prey Veng	Kompong Speu	Kandal
Very poor[a]	-	3,060	-
	(-)	(72.7)	(-)
Poor	3,890	2,580	2,980
	(60.0)	(69.2)	(14.3)
Marginal (negative)	4,260	1,490	3,500
	(100.0)	(100.0)	(75.0)
Marginal (positive)	3,690	1,430	3,320
	(96.0)	(100.0)	(73.7)
Well-off	3,460	1,430	3,250
	(94.0)	(100.0)	(57.1)
Rich	3,580	1,380	-
	(90.5)	(100.0)	(-)
Average	3,560	1,860	3,330
	(89.0)	(88.3)	(51.3)

a Figures in parentheses show the percentage of participating households

The sharper inverse association between socio-economic class and productivity observed in the rain-fed situation compared to irrigated rice can probably be explained in terms of input use. Poor households generally make much more intensive use of home-based inputs and family labour, while better-off households tend to use more hired labour and purchased inputs (e.g. fertilisers and pesticides). Since modern rice varieties are much more sensitive to fertiliser application and irrigation (to which better-off farmers have greater access) the inverse relationship tends to disappear. For traditional varieties, where labour is the most important input, poorer farmers appear to have an advantage, leading to the kind of productivity differentials observed. This is brought out more clearly below, where estimated returns to family labour are shown. Thus, under rain-fed conditions the poor have higher returns to family labour despite lower use of cash-purchased inputs, while for irrigated rice, the poor (represented here by the marginal (negative) category) have higher yields and higher use of inputs, but lower cash returns to family labour. The tendency of the poor to over-exploit family labour is an attempt on their part to overcome the subsistence constraint imposed by inadequate access to productive assets.

Table 6.2. Returns on Household Labour in Irrigated and Non-Irrigated Areas (riels / ha.)

	Irrigated		Non-irrigated	
	Average	Poor	Average	Poor
Cash costs	291,200	620,000	178,800	75,900
Labour costs	167,200	284,700	6,800	-
Total	458,400	904,700	185,600	75,900
Gross returns	1,291,000	1,631,000	651,000	1,071,000
Net returns (to household)	833,000	727,000	465,400	995,000

2) Marketed Surplus

In the two irrigated areas (Prey Veng and Kandal), gross marketed shares were found to range from 40 to 50 percent of output per cultivating household. In Kompong Speu, the share was only 7 percent. In net terms (*i.e.* net of purchases), the marketed quantities averaged 25 to 30 percent for the former and -43 percent for the latter, implying that for the deficit area of Kompong Speu purchases of rice were much higher than sales. All socio-economic groups in the irrigated areas had some marketed surplus (the poorest and the richest tending to sell

proportionately more than the other groups). In the deficit area, all except the richest had large net deficits (purchases).

There are interesting differences among the three areas in terms of the seasonal patterns of paddy rice sales. In Kandal, the tendency is to sell immediately after harvest in order to repay debts incurred on a number of counts. Credit purchase of rice is widespread in the area. Payments for irrigation water are usually made in kind after the harvest, in terms of a proportionate share of output. In Prey Veng, the pressure to make distress post-harvest sales is much lower, so sales are much more staggered. This is even more pronounced in Kompong Speu, where peak sales occur about four months from the harvest. The motivation here is somewhat different. Given the large net rice purchases that have to be made, households try to hold on to their produce as long as possible. This is a risk-averse attitude that is intended to keep basic requirements of rice in stock with sales taking place only when other alternatives have been exhausted. This assumes greater importance in view of the scarcity of consumption loans (in contrast to Prey Veng) or credit from shopkeepers (in contrast to Kandal).

Figure 6.1. Monthly Patterns of Paddy Rice Sales (three villages)

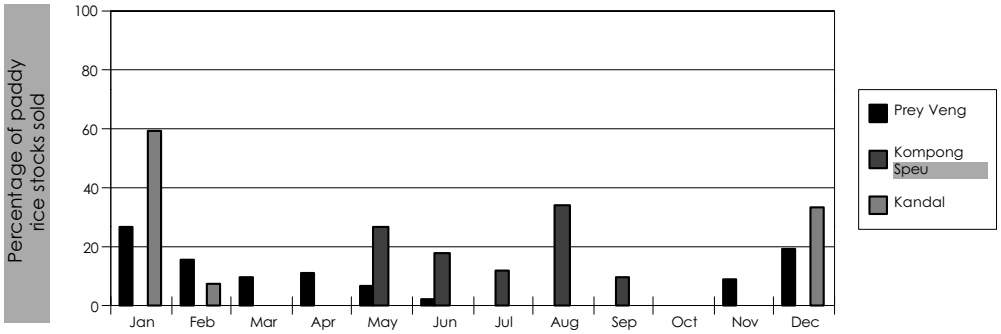
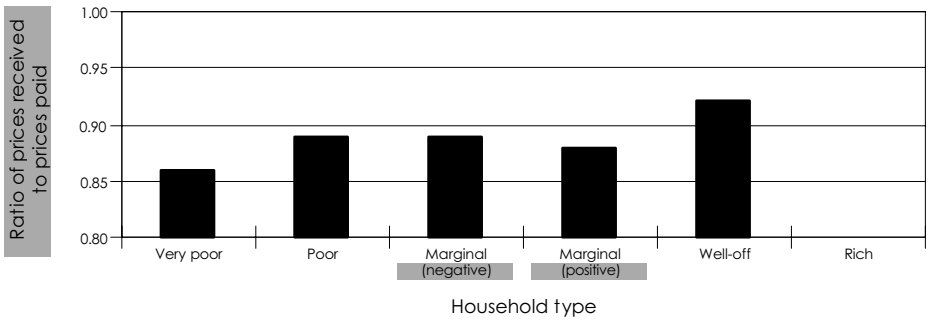


Figure 6.2. Price Received to Prices Paid for Paddy Rice (Prey Veng)



The timing of sales is an important determinant of prices received by the farmers due to seasonal price changes that occur over the crop cycle. The differential staying power of poor and better-off farmers means that the latter tend to sell early in the season when prices are low, while the former sell later and receive higher prices. Similarly, better-off households tend to buy (if necessary) soon after harvest, while poorer households are forced to buy at pre-harvest peaks. Since food security is an important objective at the household level, this is usually manifested in retaining sufficient rice stocks at home. When these are depleted, households will try to build up stocks. Richer households thus tend to buy in bulk while

poorer households are forced to purchase smaller quantities at greater intervals.[3] The terms of trade in paddy rice are therefore different for different categories of households.

Other aspects of market participation include the frequency, level and size of transactions. In terms of frequency, we found that 83 percent of households sold paddy rice at least once in Prey Veng, 46 percent sold twice and 32 percent sold three times, 17 percent sold four times and 8 percent sold five times at different periods over the year. In Kompong Speu and Kandal, the incidence is much lower: 8 and 22 percent of households in these areas sold paddy rice. Of these, two and four households respectively were able to repeat this a second time, while none sold a third time. This points to the highly constrained nature of market participation (as a seller) in the rice-deficit and fishing villages, with implications for the terms of trade or exchange.

The level of rice purchases is shown below. Volumes purchased per household are highest in Kandal and lowest in Prey Veng. All households were found to buy rice in Kompong Speu, and even in Prey Veng 34 percent of households had to buy rice. Transactions were mainly in cash, though significant credit purchases were noted in Kandal.

Data on a set of transactions (sales and purchase) were obtained during the survey. It is interesting to note that the size of transactions appears to be large or bulky. On average in Prey Veng, the volume of each purchase was around 72 kg. In Kompong Speu and Kandal, the volumes were 41 kg and 23 kg per transaction. It would thus appear that there is a preference to buy in bulk, motivated by a number of concerns: transport costs are lower, better prices and, perhaps foremost, a tendency on the part of households to ensure that they have sufficient stocks at home. It is only the poorest who have to buy frequently and in small quantities, and therefore at higher prices. It is also interesting to note the much lower purchase price in Prey Veng.

Sales of paddy rice by households also tend to be in bulk. Once again, savings on transportation and marketing costs are motivating factors along with a higher price obtained. This could also be due to the pressing need to repay debts incurred earlier in the crop cycle.

Table 6.3. Rice Purchases (kg per household)

	Cash	Credit
Prey Veng (surplus)	360.5	-
	(34)	(-)
Kompong Speu (deficit)	276.0	141.3
	(100)	(10)
Kandal (fishing)	478.2	340.0
	(100)	(39)

Note: Figures in parentheses show the percentage of households

Table 6.4. Scale of Transactions

	Rice purchases (kg per transaction)	Price per kg (riels)	Rice sales (kg per transaction)	Price per kg (riels)
Prey Veng (surplus)	71.9	554	1,160.0	301
Kompong Speu (deficit)	41.2	701	275.0	398
Kandal (fishing)	22.7	688	961.0	328

[3] It is interesting to note that paddy rice sales tend to be in bulk for all social groups. Purchases, however, tend to be in bulk for the richer groups only.

Although the production, processing and trade in rice (as well as its use as a medium of exchange) are important rural activities, we note that this importance is highly variable by season, by area and by socio-economic class. Thus, in order to understand the dynamics of food security, it is imperative to go beyond rice production and rice markets.

Chapter Seven

Market Participation

1) The Land Market

We were surprised to encounter considerable inequalities in the distribution of land in the context of apparent land abundance in Cambodia so soon after the conclusion of a major land distribution programme. There are various possible reasons for how this may have come about: loss and dispossession of land occurring through the land market is one possibility; population expansion and the laws of inheritance may be another; a third factor probably relates to the ability of more powerful households to expand their holdings not only through purchases but also through clearing forests. Another possibility cannot entirely be ruled out—that the initial conditions themselves were less than perfect. A thorough investigation of all these factors is beyond the scope of this study and is best left as a priority for future research. In this section we turn to the operation of the land market.

There is significant land market activity in Cambodia. At one end of the scale there are large institutional and quasi-institutional land owners that include the army (more accurately, individual generals) and international (usually regional) agri-business interests. Vast tracts of both agricultural and forest lands have been taken over by these groups, taking advantage of a weak regulatory framework, poor enforcement of property rights and widespread corruption. This is leading to widespread land-grabbing by powerful vested interests, pointing to an emerging dual ownership pattern in the rural areas: a peasant subsistence sector (which we are basically examining in this study) and a nascent commercial sector. Little has been forth-coming by way of investment in the latter, so that the principal motivation here seems to be timber extraction and land speculation. Although this sector is believed to be large, its actual size is not known.

The size of the peasant sector has been determined by the land distribution programme. Its future potential for expansion is contingent on a number of developments, chief of which is the expansion of the "commercial" sector, demining of agricultural land, particularly in the northwest, and land available for clearing and reclamation. All the signs suggest that further expansion will be increasingly difficult.

In terms of the speed and scale of land transactions within the peasant sector, our data suggests that these are significant. During the reference period (the past five years) between 11 to 13 percent of the total land changed hands. The rich and well-off were net buyers, while the poor were found to be net sellers. Thus in Prey Veng and Kompong Speu, the better-off households increased their landholdings by 15 percent, while in Kandal they registered an increase of almost 50 percent. The dramatic change in Kandal is due to the sale of low-quality, marginal lands.

The speed of land transfers does not appear to be small and these certainly tend to aggravate an already adverse land ownership distribution. Nevertheless, it is not a sufficient explanation of the kind of inequalities in land that have been observed. The companion case studies to this report point to the importance of land division through inheritance as well as selective expansion of holdings through land clearing—an option available to the more influential and resourceful (McAndrew 1998). This is clearly an important area of further work.

2) The Market for Animals

Ownership of and trade in animals seems to be concentrated in the hands of the better-off households. In terms of market share, they account for over 80 percent of market purchase/sale values, dealing mainly in pigs and cattle. The poor and female-headed households are mostly restricted to the ownership of and trade in chickens and ducks.

The value of sales was generally found to be higher than that of purchases, indicating the existence of raising profits accruing mostly to the better-off. The market for animals therefore, does not appear to provide a significant avenue of incomes or profits for the poorer households whose scale of operations are tiny. Indeed, for the poorest profitability appears to be negative. Surprisingly, female-headed households appear to perform better on this count.

Table 7.1. Value of Animal Purchases / Sales (riels)

	Purchases	Sales	Ratio sales/purchases
Class			
Very poor	3,500	2,700	0.77
Poor	15,900	56,700	3.54
Marginal (negative)	4,900	42,900	8.75
Marginal (positive)	22,100	80,100	3.62
Well-off	95,400	137,300	1.44
Rich	54,900	253,100	4.61
Gender of household head			
Male	60,900	138,400	2.27
Female	10,000	41,300	4.13
All households	47,600	112,900	2.37

3) The Tenancy Market

A possible mechanism that may be used by the poor to overcome the disadvantages of inadequate resources is to engage in the tenancy market for land, animals or trees. Our study reveals significant involvement in these markets.

Tenancies in land were found in all three areas. There was a low incidence of share contracts, with the predominant form of contracts being of the fixed-rent type, in cash, kind or both. In Prey Veng, 26 percent of households were involved in the tenancy market either as a taker or provider, while in Kompong Speu and Kandal, the rate was 14 and 26 percent respectively. In terms of land, this represents about 13 percent of the cultivated land in Prey Veng and 10 and 12 percent in Kompong Speu and Kandal. The rent for land is 1.0 to 1.2 tons of paddy rice per hectare if paid in kind, or 150,000 to 400,000 riels per hectare (depending on the land quality and area) if paid in cash. However, despite a significant tenancy market in land, transactions appear to be mostly among non-poor households.

Table 7.2. Incidence of Tenancy in Land

	Households (percentage)	Land per household (hectare)
Prey Veng (surplus)	26.0	0.99
Kompong Speu (deficit)	13.7	0.14
Kandal (fishing)	26.3	0.38

Besides land, animals are also shared.[1] Forty-five households (19 percent) of our entire sample was found to have shared animals, with participation rates found to be higher for female-headed households (25 percent of female-headed households compared to 11 percent of male-headed households). Thus, at the margin the animal share market may provide a useful source of income for some asset-poor (female-headed) families.

Rental of palm trees was found to be extremely important in Kompong Speu, less so in Kandal and almost non-existent in Prey Veng. The incidence of sharing trees was 50 percent of households in Kompong Speu (17.5 trees per household, implying a grand total of 528 trees). Contracts are again of the fixed type, generally payable in kind, *i.e.* sugar.[2] Once again, we found that the transactions tended to be dominated by the non-poor, with the well-off alone accounting for almost 70 percent of all trees.

The evidence points to the sobering conclusion that even though the tenancy market may be of some significance to sections of the medium or non-poor peasantry, it does not go far in addressing the resource needs of the poorest.

4) The Labour Market

The rural labour market is complex, heavily segmented and rapidly changing—a result of resurgent socio-economic forces after years of repression. In terms of structure, it can be thought of as comprising a number of broad elements:

1. A wage labour market segmented by gender, in which wages are paid in cash on a daily basis (with or without meals);
2. A contract labour market in which payments may be in cash or in kind based on a specified volume of work, e.g. at harvest time or digging and moving earth. Often, migrant labour, both male and female, seems to prefer contract work;
3, Exchange labour—an extremely important form of labour-sharing that is predominantly but not exclusively performed by women. Variants include payments or repayments in labour (typically female labour) for credit. The central element of labour exchange is reciprocity, which can either be specific in terms of mutual obligations or left vague or "general" depending on the transacting parties involved; and
4. Work on one's own account, which could be a distress option or a preferred form of labour use. The former relates to migratory pressures to enter into risky work (e.g. hunting, gathering, foraging in malaria-infested forests) while the latter consists of on-farm or off-farm work in the homestead, e.g. in cultivation, animal-raising, processing, retailing or trading, and gathering activities. Labour migration to towns and to other rural areas is on the increase, and at the same time traditional gender division of labour is being altered and transformed.

[1] This usually takes the form of what is known as *provas*, in which the person raising the animal will get the first offspring and every other offspring that is produced.

[2] In 1995–96 in Trapeang Prei (Kompong Speu), the rental rate was 4 kg to 8 kg of sugar per tree.

All of these forms of labour use are in evidence in our study areas, but their relative importance varies considerably from place to place. This appears to be related to local production conditions, economic activities and demand conditions.

Prey Veng—The Surplus Area

Ninety percent of the households here cultivate their own lands, while the remaining 10 percent have to depend on the wage labour market or small-scale trade, supplemented by gathering activities. The local demand for labour in agricultural and non-agricultural activities is high enough that there are seasonal inflows of labour into the area in response to demand. Seasonal out-migration has also been reported, especially after the harvest. It was reported that 23 people from as many households have left the area for a variety of work. Destinations included neighbouring markets, Phnom Penh and even Thailand.

It appears that before 1994, households depended primarily on exchange labour, especially when it came to rice cultivation. Thus, those people owning draught animals would help with ploughing and raking their neighbours' fields in exchange for labour for transplanting, harvesting or pulling seedlings. Generally a morning of ploughing or raking is paid back with one day's labour in transplanting or pulling seedlings, with the men supplying the former and women or girls supplying the latter. Male labour will not normally be available for agricultural work such as transplanting or weeding. Although the incidence of exchange labour appears to have declined significantly, replaced by wage or contract labour, it remains popular particularly with medium and poor households. Our estimate suggests that about 40 percent of households here still depend primarily on exchange labour.

Rising inequalities in land ownership, a shift to modern rice agriculture followed by a sharp increase in labour demand, and inflows of migrant labour from outside the village are factors behind the decline in the importance of exchange labour.[3] Male labour wage rates are higher (4,000 to 5,000 riels per day) than female wage rates (2,500 to 3,000 riels per day). However, the latter usually relates to agricultural work (transplanting, harvesting or pulling weeds) while the former relates to "men's work," *i.e.* digging or moving earth, ploughing, construction, etc.). No distinctions are made between local and outside labour.

Some collection and gathering activity was also observed, especially among poor women and children. Collection of crabs, wild vegetables and leaves and gathering of firewood is common for women. Children will in addition help out with feeding animals and in family retail businesses. Sometimes children from the poorest households will be sent to work in another household, in which case they will be paid in paddy rice (300 to 500 kg per year).

Reference to Tables 7.3 and 7.4 (see below) will place the discussion above in perspective. In the surplus area, male workers from only 6 percent of households were engaged in agricultural wage work, while the figure for non-agricultural wage work was 18 percent. On the other hand, female workers from 19 percent of households were found to be engaged in agricultural wage work and only 2 percent in non-agricultural work. Interestingly, for the same type of work, there does not appear to be much of a wage differential between men and women. It is also interesting to note the high participation rate of women in the exchange labour market.

Kompong Speu—An Area in Deficit

The area suffers from frequent drought, making its principal crop of traditional rice rather uncertain. Demand for labour from agriculture is not high and the limited demand is generally

[3] It was observed that a significant number of the poorest households have become landless and moved out of cultivation and into wage work, notably earthworks, building dykes, construction, cutting forests, etc.

catered to through labour-exchange arrangements. In other words, wage labour demand for agricultural work is small—14 percent of households have reported female wage work in agriculture, on average working only 16 days per year. Male participation is insignificant—only two households reported male wage work in agriculture, each working around 50 days per year. However, wage labour deployed in non-agricultural work is important and has been increasing rapidly in recent years for both men and women.

Reliance on the labour market has been gradually increasing in Kompong Speu. Palm sugar making, which is the second most important economic activity after rice cultivation, has been declining—a result of the high production costs involved. This has led to the swelling of the supply of labour and, in the absence of enough local work, resulted in increased seasonal migration. Other distress symptoms have been noted as well. Fishing and frog hunting have increased, intensifying pressure on local common pool resources. Gatherers have switched to using techniques such as electric rods and battery lights, and unlike the traditional use of these resources for subsistence, are increasingly turning to commercial sale. Thus, frogs are sold at 1,000 riels to 1,800 riels per kg compared to one year earlier when they were sold at 2,000 riels to 2,500 riels per 40 frogs. The change from numbers of frogs to kilograms itself is interesting and indicative of greater commercialisation on the one hand and heavier resource depletion on the other. The involvement of women in the labour market in non-traditional areas of work is also noteworthy. Since 1993, women have been increasingly engaged in earth work, digging ponds, building irrigation channels; work that has been traditionally regarded as men's work. This kind of work is contract-based, in terms of cubic metres of earth moved, for example. Wages depend on work volume not gender. Since much of the non-agricultural labour demand originates from outside the village, there is a lot of migration of both men and women.

Labour exchange is important in Kompong Speu. In one form, women will work equivalent number of days in each other's fields, equivalence often carefully defined in terms of the number of bundles of rice seedlings transplanted or pulled. Those lacking draught animals will try to exchange (female) labour for ploughing. The importance of exchange labour is revealed in Table 7.3 overleaf, where we find 42 percent of households engaged in female labour exchange.

This still leaves a lot of work for women and children in the household to pursue. Women process the palm juice that the men bring in to make sugar. Marketing of the sugar is also women's work, in addition to homestead gardening and raising animals. Much of the subsistence collection and gathering of food (crabs, snails, wild vegetables, yam, firewood) also falls to women and children. It would be fair to say that women in Kompong Speu have less free time than men.

Harsher conditions in Kompong Speu have led to shifts in the gender division of labour, intensification of exploitation of common property resources, more non-agricultural work and migration.[4] The burden of work, especially on women, is intense and further increasing as poor households attempt to cope. Migration has become an important element of this coping strategy, including venturing into risky forest areas to collect firewood and to urban areas to work on construction sites.

[4] Eighty percent of non-rice foods consumed are gathered or collected. Women from the poorest households will travel 8 km to 10 km in search of wild yams during the lean season which they will then exchange for rice. During the last lean season, women from 12 households (out of 60) went off together to collect yams. Similarly, large numbers of men with oxcarts will venture far into risky forest areas to bring in firewood.

Kandal—The Fishing Village

The fishing village is flooded for six months in a year. During the rainy season, 90 percent of households engage in fishing as their primary economic activity, while others engage in gathering and hunting of wild vegetables, snails and rats. Collection of thatch for building and firewood are important supplementary activities. Twenty-five percent of households raise fish in cages for sale and another 25 percent raise animals for sale or hire. Smoking fish and fish trading take up a lot of time, especially for women.

The major agricultural crops are reeds, rice and maize. A shift from reeds to rice began about four years ago when high-yielding rice was introduced for cultivation under modern irrigation (with surface water pumps) in the dry season. Half of all households now cultivate rice, which has led to increased labour demand in the area. The shift to rice from corn or reeds was stimulated by the rise of irrigation entrepreneurs in the area who had brought in pumping machines and enabled farmers to have access to irrigation on credit, to be adjusted at the harvest in kind (the rate was 800 kg per hectare in 1996). This experiment was a mixed success. The increase in rice acreage was plagued by frequent short crops and attacks by rats, causing widespread defaults on payment for irrigation, leading many budding entrepreneurs to abandon the water market. Many cultivators also had to withdraw from rice cultivation to engage in the labour market.

Thus, in terms of labour use patterns, the most important are fishing and related activities (including smoking, processing, trade, cage culture, etc.) that are based on available family labour. Similarly, gathering activities are family labour based. Agricultural activities were traditionally dependent on family labour, with exchange labour playing an important supplementary role. With the advent of irrigated rice cultivation and high demand, labour hiring has increased substantially with wages at around 2,500 to 3,000 riels per day for women and 4,000 to 7,000 riels per day for men. Local labour is insufficient to meet local demand, and there is a large seasonal influx of labour, especially female labour, during the dry season. Exchange labour, though on the decline, remains the predominant form of non-family labour use. Arrangements are reciprocal and specific. In the event that men's work is to be exchanged, the repayment rate is two days of female labour for one day of male labour.

Out-migration used to be rare but has been on the rise in recent years. Emerging restrictions on fishing including restrictions on the size of nets, intensification of floods and low catches has led to some out-migration for employment. An estimated 12 percent of households have reported migration of family members in search of work.

Table 7.3. Monthly Earnings of Women in Labour Market (riels)

	Prey Veng	Kompong Speu	Kandal
Agricultural work			
Earnings / particip. household	217,334	48,176	26,426
Household particip. rate (%)	19.0	14.3	6.8
Wage rate	2,500	2,900	2,900
Non-agricultural work			
Earnings / particip. household	46,373	37,079	46,583
Household particip. rate (%)	2.2	6.3	1.5
Wage rate	4,600	1,500	2,000
Exchange labour (imputed)			
Earnings / particip. house	30,002	18,602	-
Household particip. rate (%)	44.0	42.0	-

Table 7.4. The Male Labour Market

	Prey Veng		Kompong Speu		Kandal	
	Agric.	Non-agric.	Agric.	Non-agric.	Agric.	Non-agric.
Household particip. (%)	6.0	18.0	3.3	32.0	6.3	15.0
Wage rate (riels)	2,905	4,557	2,820	2,607	5,298	2,714

Despite very different labour market conditions in the three areas studied, some commonalities may be identified. The poor are increasingly forced to depend on the labour market for their livelihoods. When local demand conditions are adequate, out-migration is small. This seems to be the experience of areas such as Kompong Speu and Kandal, where the introduction of modern rice cultivation has raised demand for labour. In the face of inadequate or dwindling demand, migration is the only answer. The experience of Kompong Speu is a forceful reminder of this trend. The increasing pressure on common property resources, adverse shifts in the pattern of traditional rights to common resources and a tendency towards land and asset inequalities has reinforced the dependence of the poor on the formal wage labour market. These trends have also begun to alter the traditional gender division of labour and ushered in more formal wage contracts in the labour market, replacing older forms of labour sharing and mutual exchange practices.

5) The Credit Market

The economic or efficiency benefits of credit result from the fact that resources are transferred from low productive uses or less urgent activities to more productive uses, thereby increasing overall welfare. There is a great variety of informal credit proliferating in rural Cambodia, mediated in cash, in kind or in a combination of the two. In some types of credit, there is an explicit interest rate involved, while in others it may take indirect forms.

The nature and extent of intermediation through the credit or financial market is of particular interest to rural households. Given the vagaries of agricultural production, wide fluctuations in incomes, the high incidence of shocks (illnesses, accidents, etc.) and the paucity of reserves *i.e.* savings and food stocks, especially for poor households, financial markets may be of pivotal importance in smoothing consumption and ensuring food security.

Rural Cambodia is inadequately serviced by development institutions. Government ministries have little visibility at the local (commune) level and NGOs working in development are spread thinly and unevenly throughout the country. The financial system is weak and rural banking virtually non-existent. Thus, there is hardly any formal or institutional financial intermediation in rural areas. When one talks of credit markets in the Cambodian context, one is referring essentially to informal markets.[5] Similarly, a large class of financial transactions are broadly known as inter-linked, or in more value-loaded terms inter-locked, credit markets, since these typically sit astride more than one market (see Bhaduri 1977).

Participation in the Credit Market

A high incidence of involvement in credit markets was observed for all three areas. Participation rates were invariably much higher for poor households. In terms of households reporting outstanding credit, the highest incidence was in Kompong Speu at over 90 percent, followed by 76 percent in Kandal and 63 percent in Prey Veng. For poor households, this incidence was uniformly high at 89 to 94 percent of households (Table 7.5). It is striking that even for a relatively short period of time (four months), a large proportion of households reported borrowing. In Prey Veng, 52 percent borrowed during the previous four months, followed by 47

[5] The terms formal and institutional are used interchangeably, as are the terms credit and finance.

and 43 percent in Kompong Speu and Kandal (among poor households, the figures were 72, 65 and 57 percent respectively). The absolute amounts borrowed or outstanding tended to be smaller for the poor, but only marginally so in Kompong Speu and Kandal (Table 7.5; see also Appendix Six). In terms of absolute levels, outstanding credit per household was highest in Kandal (347,000 riels) and lowest in Kompong Speu (128,000 riels). This pattern across the three villages is retained for more recent transactions entered into by the sample households in the three villages (see Appendix Six).

It is interesting to note that there are no significant differences between male and female-headed households in terms of credit market participation.

Table 7.5. Credit Market Participation

	Prey Veng	Kompong Speu	Kandal
Households reporting outstanding credit (%) - all houses	63.0	91.7	76.3
Households reporting outstanding credit (%) - poor houses	94.4	89.7	88.6
Households that borrowed in past 4 months (%) - all houses	52.0	46.7	42.5
Households that borrowed in past 4 months (%) - poor houses	72.2	64.5	57.1
Debt per indebted household (riels) - all houses	412,600	140,100	454,600
Debt per indebted household (riels) - poor houses	213,500	141,800	377,000
Amount borrowed in the past 4 months (riels) - all houses	268,700	82,000	277,200
Amount borrowed in the past 4 months (riels) - poor houses	165,300	89,100	155,500

Rates of Interest

The cost of credit from the informal money market is high. Rates of 10 or even 20 percent interest per month are not unusual, taken typically to meet short-term exigencies. It must be said, however, that there is a lot of lending at zero interest from close relatives. Table 7.6 shows that the average interest rate (derived from our entire sample) works out at over 100 percent per year. If zero-interest loans are included, this rate falls to 66 percent. There is a clear and systematic difference in the rates charged for rich and poor households, varying from 53 percent for the rich to 170 percent for the poorest.

Table 7.6. Distribution of Interest Rates

	Including zero-interest rates	Excluding zero-interest rates
Very poor	101.8	169.7
Poor	99.4	142.7
Marginal (negative)	59.0	103.3
Marginal (positive)	67.0	100.4
Well-off	33.8	57.2
Rich	29.3	52.8
Average	65.9	104.7

Use of Credit

Much of the high cost credit is related to distress borrowing—predominantly taken for rice purchases or treating illnesses. Among the poorest households, 95 percent were borrowers in the preceding four months, with 70 percent reporting that their primary reason for doing so was to purchase rice. For another 20 percent the primary reason was health-related. As one moves up the socio-economic scale, the incidence of borrowing declines along with the pattern of use made of credit. Although the richer classes do participate substantially as borrowers in the credit market, their main purposes are not for rice purchases or health treatment, but are more likely to be related to working capital or input costs.

Table 7.7. Use of Loans (during past four months)

	Households borrowing (percentage)	Rice purchases	Health treatment
Very poor	95.2	70.0	20.0
Poor	66.7	62.0	16.0
Marginal (negative)	81.8	40.0	17.0
Marginal (positive)	46.6	27.0	12.0
Well-off	71.7	11.0	9.0
Rich	32.0	-	-

Sources of Credit

Credit sources are few. There is a great deal of lending within kin groups, both at zero and at "market" rates of interest. Moneylenders and merchants are an important source of credit as well, while NGO or institutional credit remains undeveloped. In Kompong Speu, households appear to have some access to NGO credit, but the amounts involved are small and interest charged at 4 to 5 percent a month is not cheap, especially when one takes into account transactions costs in terms of the paperwork and time.

Table 7.8. Sources of Credit (percentage of cases)

	Prey Veng	Kompong Speu	Kandal	All three villages
Relative	65.8	26.2	39.7	45.3
Moneylender / trader	34.1	25.4	42.9	32.7
Other (NGO)	3.7	48.5	18.2	22.0

The discussion above has so far been conducted in aggregate terms. In addition, we have focused principally on the more orthodox types of informal lending, principally in cash with specified repayment periods and/or interest rates. The informal credit market is far more complex, especially when we bring in inter-linked transactions. The discussion below is an attempt to provide a more disaggregated view of informal financial transactions encountered.

6) Informal Credit—A Disaggregated View

Kandal (Fishing Village)

Local names for credit are *kchei* and *bomnol*. *Bol* is used to indicate that the interest charged will be doubled if there is default. Numerous examples of cash-kind credit were encountered in Kandal, where cash is taken two or three months before the harvest and repayment is made in kind (usually paddy rice) at the harvest. This is a familiar type of credit in South Asia, especially in the more backward, non-green revolution rice-growing areas known as *dadon*. However, these loans were identified by their generic name (*bomnol*) rather than a specific name like *dadon*. Some examples are given below:

Example One

Amount taken	120,000 riels (in cash from close relative)
Time taken	three months before the harvest
Purpose	to meet costs of cultivation (fuel, labour) and for consumption
Repayment	500 kg of paddy rice in April
Implicit/actual price	240 / 300 riels per kg = 0.8
Status of household	Marginal (positive)

Example Two

Amount taken	140,000 riels (in cash from neighbour)
Time taken	February
Purpose	to meet costs of cultivation
Repayment	700 kg of paddy rice in April
Implicit/actual price	200 / 300 riels per kg = 0.66
Status of household	Marginal (positive)

Example Three

Amount taken	200 kg of seed rice (from neighbour)
Time taken	at sowing time
Repayment	400 kg of paddy rice at the harvest

Other variations have also been reported, such as borrowing in kind and repayment in labour. This type of cash-kind and kind-kind borrowing appears to be undertaken by marginal and poor households. Lenders are described as relatives, neighbours or merchants. The implicit price reported has varied between 200 and 240 riels per kg, compared to a market price of around 300 riels.

Nine households in Kandal reported advance sales of paddy rice. Another 13 households borrowed in kind (paddy rice) mainly for seed but also for consumption, at interest rates ranging from 125 to 300 percent per year. Other forms of credit were also reported:

- Two households hired draught animals for four days (for 40,000 riels) and promised to repay in paddy rice at the harvest (300 kg). This is equivalent to a repayment of 90,000 riels over 11 months.
- It was common for fishermen to borrow money from fish traders on the condition that all the fish caught must be sold to that trader alone (at a pre-arranged price that is 300 to 500 riels lower than the market price), until such time as the loan is completely repaid. This type of credit has also been reported in South Asia, for both fish and rice, where it is known as *dadon* (Murshid & Rahman 1987).
- Thirty-seven households reported cash-cash borrowing at varying interest rates, ranging from zero (from relatives) to 240 percent per year. Four households borrowed in cash but repaid in labour. Quite often, transactions are entirely in kind (and are quite complex). Thus, one man borrowed 30 kg of rice (valued at 20,000 riels) for one month and repaid it in firewood (10 cubic metres) which he collected. In order to collect and transport the fire-wood, a boat had to be hired for three days and paid for in firewood (4.5 cubic metres). Another household borrowed 50,000 riels for treatment of malaria. Ten thousand riels was paid in interest but the principal could not be repaid. It was ultimately repaid in kind: 20 cubic metres of firewood, 2,000 *prabos* and 200 *kandab* (local construction material like thatch, together valued at 70,000 riels). In addition, three days collection of firewood had to be paid as rent for the boat used.

It will be observed that the incidence and variety of credit relations is high and numerous. For poorer people, repayment typically takes the form of kind or labour, with high implicit interest rates. Furthermore, there is flexibility in the repayment system, with cash obligations convertible to kind forms, though this may entail an even higher cost on the part of the borrower. Although delays are not unusual, outright default seems to be rare, only possible in the event of death or permanent out-migration from the area.

It may be noted that these forms of credit were reported from an area with an active credit programme, funded by UNICEF and executed by the Ministry of Women's Affairs, Under the programme, 97 households were given a loan ranging from 100,000 to 200,000 riels at 3-percent interest a month.

Prey Veng (Surplus Area)

Twenty-four households (out of 100 respondents) reported borrowing from moneylenders, with rates of interest varying between 60 and 360 percent. Forty-one households borrowed money from close friends and relatives with no interest. Loans in kind, especially for consumption, were common. These were often without interest. Cash-kind borrowing is also common. A loan in cash of 15,000 riels is repaid with a sack of paddy rice at the harvest (worth 30,000 to 32,000 riels). Land mortgages have also been reported to raise capital or meet debts and emergencies (McAndrew 1998).

A large share of the rice harvest of poor and medium households went to pay off debts incurred to meet production and consumption costs, with interest rates of up to 100 percent (McAndrew 1998). For those obtaining a larger harvest, there is ample evidence of capital accumulation. Thus, one respondent produced 70 sacks of paddy rice. She sold 40 sacks to traders from Kandal at 30,800 riels per sack, repaid some debts, and then purchased two mature oxen, a cassette recorder and a battery (McAndrew 1998).

The health-credit-rice production nexus is best explained by two case studies:

- Members of one household suffered serious illnesses resulting in a situation of perennial debt. Treatment of the wife's tuberculosis cost 300,000 to 400,000 riels per year. In 1996, a cow had to be sold (for 330,000 riels) and 60,000 riels was borrowed at 10 percent monthly interest. To compound matters, a daughter fell ill in September 1996 and was taken to the Kantha Bopha hospital in Phnom Penh. A further loan of 60,000 riels was taken for this purpose (40,000 riels at 10 percent and the remaining 20,000 at 20 percent per month) (McAndrew 1998).
- The husband in this family actively participated in the credit market for production reasons. He borrowed 17,000 riels to pay for transplanting expenses. Many of his other expenses, such as ploughing and irrigation, had to be paid for in gold or cash, while the remaining work was arranged on an exchange basis.

Kompong Speu (Deficit Area)

GRET (a French NGO) operated a credit programme in the village. Forty-eight (out of 60) households had taken loans from this, with amounts ranging from 100,000 to 500,000 riels at 48 percent interest per year. Twenty-one households used the credit for consumption (rice and other foods), while the rest invested it in pig-raising, trading or in palm sugar processing.

Among informal sources, moneylenders in the village and in the market place are the most common, lending in cash, gold or paddy rice. Most borrowers using these sources are from the poor or marginal social classes, with the former usually paying higher interest. Twenty households (out of 60) had borrowed from the four village moneylenders during the past year. Ten poor households paid back in cash (with interest rates of between 120 and 550 percent). Another 14 households (nine poor and five marginal) repaid in paddy rice (interest

rates of 10 to 300 percent). Five households borrowed in cash and repaid in sugar, receiving a much lower price for their sugar (330 riels against a market price of 500 riels). Two households borrowed in gold and repaid in gold (at interest rates of 120 percent).

In the event that repayment could not be made in cash (as agreed), the lender would frequently accept payment in the form of labour services. In such a case, the labour payment would be valued at half the market wage (with women usually making good this payment). This was obviously a distress option. It was reported that six of the poorest households had to take recourse to this kind of a loan in Kompong Speu every year, with repayment done in the form of half-price labour. If for some reason repayment had to be postponed until the following year (due to illness or poor harvests) then the interest rate was doubled.

An even more severe distress option was noted whereby a daily interest rate of 4 percent was charged, *i.e.* for a sum of 10,000 riels the interest rate per day would be 400 riels. This was usually a short-duration loan resorted to by the poorest to meet a sudden emergency (for a maximum period of about 10 days).

Tied trader credit was also reported by palm sugar processors. Five households took such loans from sugar trader in 1997 under the condition that all of their processed sugar would be sold to the trader until such time as the loan had been completely repaid. This type of credit had been practised since 1994.

7) Conclusion

This chapter reveals the wide variety and complexity of informal credit arrangements that dominate rural financial markets in Cambodia. Despite the often onerous terms of access, especially for poor households, these provide short-term "bridge finance" that enables households to cope with a host of uncertainties. Indeed, after labour and common property resources, it is access to credit in kind or cash that critically determines whether poor households are able to sustain their livelihoods. In the absence of formal or NGO-mediated finance in any significant scale, this assumes an important area of public intervention.

An important and perhaps more dominant form of credit takes the form of inter-linked arrangements with other markets, notably for rice and labour. These may also be superimposed on structures of reciprocal labour exchange or claims among groups of related households. Thus, it is impossible to view credit markets in isolation as the discussion in this chapter may imply. They must be seen within the overall context of household transactions and exchange mediated by money, goods, services or labour, or combinations of these.

Chapter Eight

Crises, Adjustments and Responses

The rural household economy can be viewed as being continually subject to a variety of forces emanating from both the larger economy as well as those originating in the local economy. These again may be viewed in terms of their short- or long-term impact, with the latter usually affecting the pattern of incentives faced (e.g. relative prices, supply or demand conditions, markets, wages, factor availability, etc.). The former tends to take the form of an immediate and intense shock to the system (*i.e.*, a crisis) requiring an urgent remedial response. Both types of forces can affect household food security by eroding current food entitlements or by leading to a gradual decline in the resource position of the poor.

This chapter is essentially concerned with the nature of crises faced by rural households and the manner in which adjustments and responses are made. Longer term processes in motion have been described earlier in the context of discussions relating to asset distribution and market participation, where we outlined a process of increasing asset alienation and inferior terms of trade obtained by the poor. However, in order to establish the correct context, the discussion on crises and coping mechanisms needs to be preceded by a brief introduction to the main macro trends in the economy.

Macro-Economic Picture

Cambodia has witnessed major structural changes in its economy in the last five years. The most important of these include the re-introduction of money and the private market, the opening up of the domestic economy to trade, aid and foreign direct investment, and the introduction of private land ownership in 1989. Predictably, these changes ushered in a new era of rapid growth based on timber processing and exports, construction and services. Agriculture also rallied, posting impressive rates of growth, mainly through area expansion but also through the introduction of green revolution technology.

Economic liberalisation also brought in its wake a host of problems. Rapid urbanisation has taken place. The relative lack of restrictions has attracted certain undesirable trends. Thus, Cambodia has become a haven for drug-traffickers, gun-runners and organised prostitution. Unlicensed gambling is widespread as well as growing alcoholism.

There are other kinds of worries as well. One concern relates to unchecked and indiscriminate logging, as well as the systematic misappropriation of vast areas of land which are then leased to foreign companies. There is little information on how much land is held by the state, how much has been appropriated by numerous generals and how much has passed into foreign hands. It would appear that foreign "investors" have been entering into direct negotiations with the generals who are disposing of public property at knock-down prices with

virtually nothing accumulating in state coffers. For the most part, these lands are not used for productive purposes but are merely plundered for the timber and held for speculative reasons.

Rural Cambodians still enjoy (and depend on) access to common property resources. This traditional dependence is becoming increasingly threatened as forests decline or access to them is denied, and as water bodies are leased out to powerful business interests at the expense of fishing communities.

Micro-Level Developments

A number of trends have also been identified at the level of the village and the household. These are best thought of as responses to external developments affecting the rural economy. Thus, liberalisation has led to the introduction of new technologies as already noted (new rice varieties, irrigation, use of chemical fertiliser, etc.) which in turn has affected the pattern of agricultural labour demand.

Relative prices have been altered, in some cases leading to a decline in the production of certain crops (cabbages, other vegetables, fruits) or activities (such as palm sugar making). On the other hand, the example of reeds in Kandal suggests that farmers are able to take advantage of increasing demand generated from across the border (in this case Vietnam) and are expanding production.

Profound changes also appear to be in progress in the structure of the labour market. There has been a move away from labour exchange to cash wages paid on a daily basis or at piece rates. The traditional gender division of labour is also breaking down as more and more women are found to engage in (heavy) earth-moving work and construction (interpreted here as a sign of distress). Migration is on the rise as both men and women are forced to venture further and further in search of work.

We have also noted mounting pressure on common property resources as poor households attempt to stabilise consumption and income. Increased pressure is demonstrated by the need to travel greater distances to collect firewood or wild vegetables, by the larger number of full-time hunters/gatherers, and by the use of more sophisticated traps and equipment.

Perhaps the most worrying trend of all relates to the rising inequalities in asset ownership, which appears to be related to the trends discussed above, *i.e.* increased pressure on common property resources, migration and changes in labour market conditions. The ability of households to face and respond to crises cannot be seen in isolation from these broader trends in the national and rural economy.

1) The Structure of Crises

The structure of crises is roughly similar in all the three areas studied. Crises listed include crop failures, illnesses or accidents, death of a household member or of animals, loss of assets, indebtedness, and falling victim to swindling or cheating.

Crop Failures

The factors leading to crop failure depend on local agro-ecological conditions. In Kompong Speu the main factor is drought, while in Kandal and Prey Veng flooding is an important factor in addition to pest and rodent attacks. Thus, many of our respondents in Kompong Speu reported crop losses in 1994 and 1995, though this appears to have been really serious for only seven households (that reported damage to a third of their crops due to drought).

Our respondents in Kandal generally reported good harvests for the period from 1992 to 1997, though they noted significant losses due to rats and flooding. Out of 80 households, 14

reported rat damage, with each household losing one to two tons of paddy rice. In one case, rats destroyed an entire crop of rice and lotus, forcing the family concerned to migrate in search of work. Twenty-four households reported flood damage, while four maize-growing households lost their crops to rats and floods, again leading to indebtedness and migration. The experience of Prey Veng appears to have been slightly better. Although 90 percent of households reported some damage over the 1992–97 period (mostly due to floods and rats), the magnitude of damage was small.[1]

Table 8.1. Households Reporting Damage from Various Events, 1992-97

	Prey Veng (households)	Kompong Speu (households)	Kandal (households)
Flood	90	1	24
Drought	-	29	5
Pests	-	2	16
Other	-	15	-
Total (percentage)	90.0	78.3	63.8

Table 8.2. Losses Sustained from Damage Due to Floods, Drought, etc. (riels)

	Mean (riels per household)	Median (riels per household)	Affected households
Prey Veng (surplus)	587,700	455,000	90
Kompong Speu (deficit)	261,400	101,000	47
Kandal (fishing)	892,000	435,000	51

Health/Illness

Complaints regarding health and illness were widespread in all three villages. In Prey Veng, 41 percent of households reported someone being "seriously ill" over the past year. The cause of illnesses were reported as "serious fever," asthma, *speuk,* tuberculosis, malaria, typhoid, dengue fever and hyper-tension. Numerous cases were encountered where illnesses led to distress sales of food stocks (paddy rice), sale of land or animals, or credit at high rates of interest. Thus, two households reported spending between 600,000 and one million riels to treat malaria, resulting in the renting out of half a hectare of land for five years and sale of four cows. Two other households with members suffering from tuberculosis had to spend between one and three million riels, which required distress sales of paddy rice and gold and subsequent indebtedness.

Around 50 percent of our households in Kandal reported serious illness over the past year. The most common complaints were malaria, typhoid, cholera and, for women, complications in child birth, diarrhoea and hepatitis. Similarly, around 40 percent of households in Kompong Speu reported serious illnesses including tuberculosis, malaria, dengue fever, diarrhoea and birth complications. A number of premature deaths were reported in Kompong Speu. Over the past five years, 17 people had died, 10 children aged under five and seven adults. These health shocks invariably tend to lead to indebtedness and asset liquidation.

The cost of ill-health and sickness cannot be assessed merely in terms of expenditures and the manner in which these are financed, but also in terms of the opportunity cost from days of labour lost and earnings foregone. As the data in Table 8.3 overleaf show, these costs can be considerable.

[1] It should also be noted that the households in Prey Veng are better off in terms of access to resources, so their staying power is much better than those in Kompong Speu and Kandal.

Table 8.3. Days Lost and Expenditures Incurred Due to Illness in Last Three Months

	Days of labour lost per household	Expenditure per household (riels)
Prey Veng (surplus)	7.6	46,900
Kompong Speu (deficit)	10.6	27,200
Kandal (fishing)	18.7	61,300

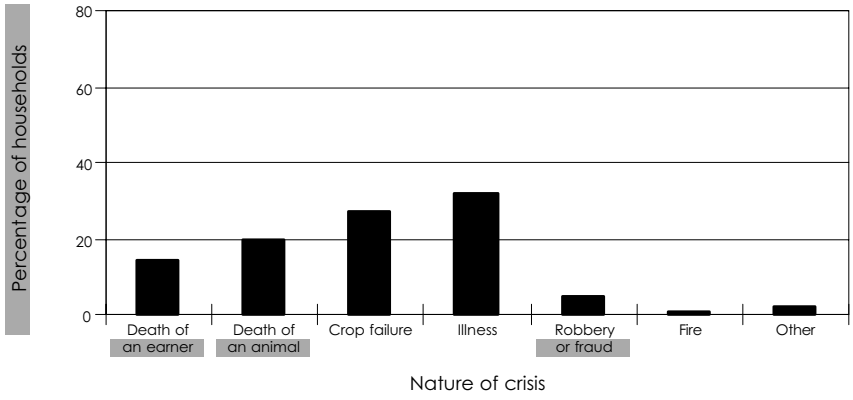
Animal Mortality and Disease

Raising livestock appears to be precarious. Twenty households reported the death of at least one animal over a five-year period in Prey Veng, including nine cows, 19 buffalo and three pigs. Similarly, eight cows, one horse and 34 pigs died in Kompong Speu over a three-year period. Few families attempt to raise livestock in Kandal as the area remains flooded for six months in the year, making it difficult to find dry places to keep animals as well as to find adequate forage. Of the twenty families that kept animals in Kandal (all of which were taken care of by villagers in neighbouring, flood-free areas for half of the year on payment), six households reported the death of five cows and five pigs. Seven families incurred "substantial" losses from cage fishing, an important income-generation activity in the area.

In addition to the above, households face a variety of hazards including theft of animals, gambling loss, fire and accident. However, it is important to be able to distinguish the kind of crises that are faced more regularly or are more threatening for a given household.

Our households were asked to comment on the nature and incidence of crises experienced over the longer term (five years) and over a four-month period. The predominant type of crisis in the short-term, not unexpectedly, related to health. However, even in a five-year time frame, a majority of households identified health emergencies as the most important crisis faced, followed closely by crop failures. The second and third most important shocks faced were also related to health for the vast majority of households in our sample.

Figure 8.1. Structure of Crises—Primary Crisis in Previous Five Years (all villages)



Crises Faced by Class

It is possible that the nature of shocks is essentially random and unpredictable, and would therefore tend not to discriminate between the rich and the poor in terms of incidence. This is particularly likely to be true for events such as floods and drought rather than illnesses, since the poor may be more susceptible to morbidity and disease.

The evidence produced in the tables below suggests that, in absolute terms, losses sustained from weather factors or pests are much higher for better-off households (though in relative terms, *i.e.* as a proportion of total production, the picture may well be different) than

Figure 8.2. Structure of Crises—Second Crisis in Previous Five Years (all villages)

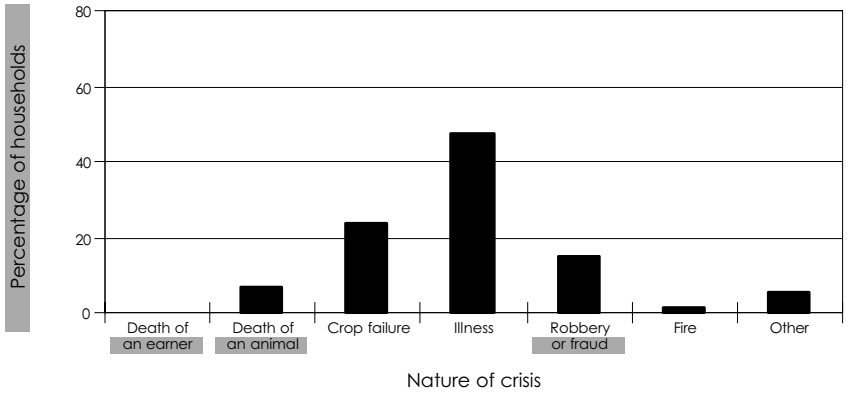


Figure 8.3. Structure of Crises—Third Crisis in Previous Five Years (all villages)

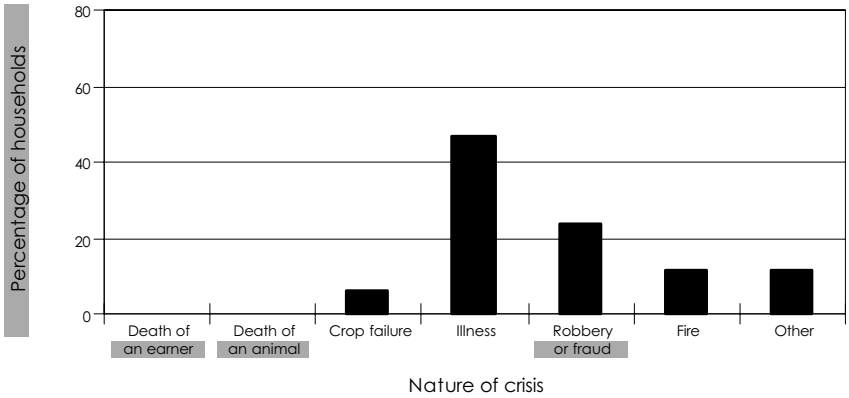
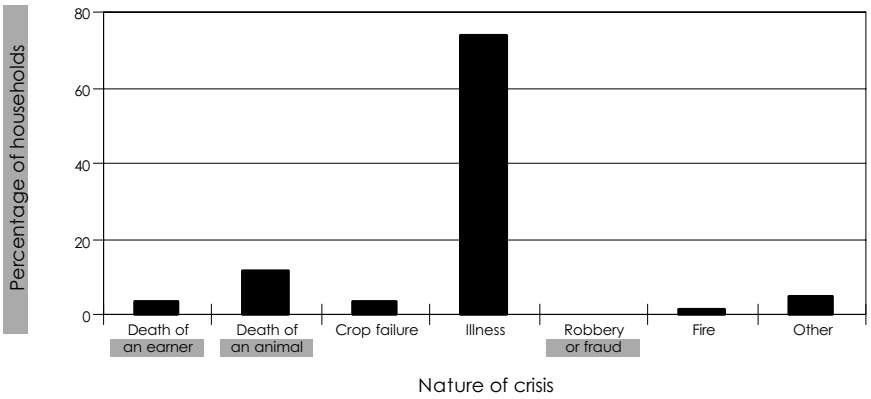


Figure 8.4. Structure of Crises—Primary Crisis in Past Four Months (all villages)



for poorer households. Similarly, in absolute terms, loss of animal assets is greater for better-off households. Interestingly however, the expenses that poor households have to incur due to health-related factors were found to be similar or slightly higher in absolute terms compared to the rich. In relative terms, the burden on the poor is clearly much higher.

Table 8.4. Losses From Weather Factors and Pests in the Past Five Years (all villages)

	Losses (riels per household)	Percentage of households
Very poor	190,600	5.7
Poor	269,900	13.9
Marginal (negative)	248,300	15.2
Marginal (positive)	482,100	25.0
Well-off	522,700	32.7
Rich	1,663,000	7.8

Table 8.5. Household Emergencies—Health Treatment and Death of an Animal in the Past Year

	Health treatment (percentage of households)	Animal loss (percentage of households)
Very poor	92.9	-
Poor	85.7	3.6
Marginal (negative)	86.1	8.3
Marginal (positive)	84.5	10.3
Well-off	84.5	8.5
Rich	84.2	10.5

2) Responses to Crises

The ability of a household to respond to adverse forces, irrespective of their origin, depends on its ability to command resources. For a poor household, this is a distinct constraint which means it has to choose between a narrow set of alternatives. In the absence of savings or other resources, it would tend to depend mainly on its labour assets (including migration), on increasing its effort in hunting and gathering activities, on distress sale of assets (if any) and on consumption loans and credit. Frequently, labour, credit and grain markets can become interlocked, which forces the poor to under-sell their labour, especially female labour (used to repay, for example, consumption loans). We have already discussed the structure and role of the labour and credit markets, as well as pointing to the critical importance of common property resources as a residual, natural "safety net."[2] Only five households in our entire sample of 240 households thought that dependence on common property resources was not important for them. All of the rest considered access to common property resources to be either very important or moderately important.

The demand for labour has also been buoyant in recent years, so that it too has served to stabilise income and consumption. The question that assumes some importance in this connection is whether these roles are sustainable.

We also attempted to understand the nature of the adjustment process by asking our respondents to assign scores on a scale of 1 to 4 in order of importance to a set of questions relating to possible adjustments or responses. These are summarised below in Table 8.6. The responses are indicated in the first row of the table (e.g. reduction of savings, access to interest free credit, selling land, etc.). The columns show the percentage of households that assigned a score of 1 or 2 (*i.e.* very important or moderately important) to a given response, by socio-economic class categories. The table clearly shows the different responses of different classes. It also brings out a few "peculiarities." The rich, relatively speaking, are seen to respond through reducing their savings or selling jewellery, or at worst disposing of an animal. At the other extreme, the poor and very poor are found to reduce consumption levels, take recourse to expensive credit, sell land and migrate. The fact that all groups report high levels

[2] See Chapters Four to Six.

of support from relatives and friends, as well as access to interest free credit, suggests that rural social and kinship bonds are not only alive but are thriving.

Table 8.6. Adjustments to Crises (percentage of households noting if response is important)

	Very poor	Poor	Marginal (negative)	Marginal (positive)	Well-off	Rich
Reduce consumption	50.0	29.4	5.4	18.0	3.8	5.3
Take out interest-free credit	64.0	53.0	51.0	66.0	60.0	53.0
Take out high-interest credit	21.0	47.0	46.0	36.0	28.0	5.3
Reduce savings	50.0	35.0	49.0	54.0	46.0	74.0
Sell gold or jewellery	29.0	24.0	41.0	34.0	27.0	47.0
Sell land	42.9	23.5	8.1	13.1	8.1	-
Sell animals	14.0	29.0	35.0	39.0	32.0	58.0
Migrate	35.7	13.1	11.8	8.1	14.7	-
Seek support from relatives	64.0	53.0	51.0	72.0	74.0	53.0

Chapter Nine

Conclusion

1) Review of Findings

Food security concerns have a vital place in the policy agenda of Cambodia, given its history of man-made disasters that have pushed millions of people into dire poverty and famine. Although the country has staged a remarkable recovery over the past decade or so, there remains a feeling of unease about the question of whether there is adequate food available and whether conditions of access are satisfactory. The fact that there has been little systematic research on food security in the country has meant that much of the discussion has tended to be based on brief field visits, interviews with officials and "knowledgeable people" and anecdotes—hardly a sound basis for effective policy decisions.

Despite limitations imposed by scarcity of resources, trained personnel and security considerations, this study has made a bold attempt to understand the status and dynamics of rural household food security in the country. The approach taken was both innovative, combining a variety of research instruments and methods, and holistic—enabling us to situate the entire discussion within a fluid and rapidly evolving socio-economic context.

In terms of status the study reveals that basic levels of consumption (in the narrow sense of calories) are "adequate" and fairly well distributed among different socio-economic classes or by gender of the household head. However, much of this is dependent on rice, consumption of which appears to be excessive (and higher than normally assumed on the basis of "availability" data from bodies such as the Food and Agriculture Organisation (FAO 1996), especially for the poorer households. Although every effort is made by each household to grow enough rice to meet own consumption requirements, market dependence (for rice purchases) is significant and growing—especially in the fishing village studied in Kandal and in the rice-deficit village in Kompong Speu.

As far as non-rice foods are concerned, much of the protein and vegetable consumed is obtained from common property resources, gathered mostly by women and children.[1] Purchased food items tend to be those that cannot be obtained for "free": pig fat, spices and condiments, sugar and salt, tobacco, etc. Since consumption of fish and rice is almost universal, the total demand for fish cannot be met entirely from common property resources (especially where agro-ecological conditions are less suitable, as in Kompong Speu), so that fish (or the fish paste *prahoc*) purchases are common. Very few households were identified as

[1] Men also engage quite extensively in hunting and gathering activities. However, they tend to engage more in firewood or timber collection, and when they do hunt for food (usually aquatic animals, frogs, birds, etc.) it is for sale rather than for consumption.

suffering from open and outright food insecurity,[2] and even these tended to be concentrated in Kompong Speu and Kandal. The much more serious problem revealed relates to some worrying trends in resource dispositions and in the operation and conditions of participation in a number of markets that does not augur well for future food security.

The food security dynamics appear worrying because the system of livelihoods seems to be balanced precariously in terms of its viability and sustainability. The acute resource constraint noted, especially in terms of access to land and animal assets, points to a situation where the poor have little to rely upon but their own labour. In the context of a "land abundant" country in a post-land reform context, this was a surprising finding.

Thus, we find that the system is held together by the interaction of a number of elements. These include the following:

A Heavy Dependence of the Poor on the Labour Market, and Especially on Female Labour[3]
The beginnings of green revolution agriculture and rapid growth, accompanied by urbanisation rates of 10 percent or more, has greatly stimulated the demand for labour and has had a positive, albeit partial, impact on welfare. At the same time, growing asset-lessness and the accumulating effects of shocks to the system has tended to force people to migrate, alter the traditional gender division of labour, or enter into "unequal" transactions whereby family labour, especially female labour, is grossly undervalued, frequently mediated by complex inter-linked transactions. Thus, there is increased pressure to migrate into ever riskier forest areas plagued by malaria, the Khmer Rouge and land mines. Women are increasingly turning to "non-traditional" work on construction sites, pond digging and other heavy work. Inability to repay credit or consumption loans usually means that their burden shifts to the women of the household, who have to pay off the loans through agricultural labour valued at half the normal rate.

A Heavy Dependence on Common Property Resources
An interesting finding was that households from all socio-economic strata were found to rely on common property resources to augment their income or consumption. However, the subsistence constraint leading to increasing efforts being focused on common property resources was found to be especially acute in Kompong Speu and Kandal, with the poorest crucially dependent on these resources. The variety and volume of foods collected have diminished, making it necessary to venture further and further afield. At the same time, the intensity of effort has been raised with the advent of full-time hunter-gatherers on the horizon, leading to fears that this traditional resource will soon become exhausted. Access to common property resources has also been affected by policy changes relating to water bodies and forests. The more productive water bodies are now leased out to powerful commercial interests, altering the traditional open access situation. Fishermen now have to make large fixed payments if they want to fish, irrespective of the (eventual) catch. Similarly, forest areas are often "protected" and can only be accessed after making suitable pay-offs.

Seasonal Migration
This too appears to be of recent origin—an option practised only under acute conditions of distress. Both men and women migrate seasonally, often in groups to neighbouring villages to

[2] A core group of 10 percent of households could be identified as being in this position. Their situation may be described as being without any assets or adequate labour endowments, with highly unstable incomes, high levels of consumption loans and indebtedness, and poor health conditions.

[3] The term labour market is used loosely to also include labour exchange transactions or exchange relations in kind.

engage in agricultural or construction work. This trend was particularly well marked in Kandal and Kompong Speu, but by no means absent in Prey Veng; presumably related to the structure of local conditions of labour demand.

Credit, Rice Consumption Loans and Interlocked Markets
Complex credit transactions have been noted earlier. The point to note is the highly underdeveloped financial market which remains acutely segmented and personalised, leading to high rates of interest, frequent default and rescheduling of loans and conversion into kind repayments, in terms of paddy rice or labour. This high cost market exists side by side with a low cost one which makes it easy to obtain rice consumption loans or even short-term, interest-free credit from relations or neighbours. High-cost credit appears to be closely related to health emergencies, agricultural production loans or loans needed to finance costs of migration. The net effect on the poor is one of pauperisation and further dependence on common property resources and sale of labour in an effort to sustain household livelihoods.

All these factors add up to a fragile and basically unstable livelihood regime that is further subjected to periodic shocks in the form of crop failures or health emergencies. Some developments in the macro-economy have had an ameliorating effect by increasing the demand for labour and the shift from a predominantly exchange labour economy to a more formalised wage labour economy—especially in the green revolution belt and in the fast-growing, urban sector. But for much of rural Cambodia, local conditions have failed to improve and in many cases have actually worsened in the face of growing inequalities in asset ownership and the decline in traditional income-generating activities associated with adverse movements in relative prices (e.g. palm-sugar making in Kompong Speu).

2) Policy Implications

A number of policy approaches are suggested by the above discussion:

Rice Production
A major concern that is often aired relates to agricultural growth rates and food (rice) availability from domestic production. It is important to place this macro concern within the context of its relevance to rural household food security. The problem with a production-oriented strategy is that the less productive areas (e.g. those lacking in irrigation infrastructure) will benefit the least, and it is precisely in these areas that the problem of food security is likely to be the most acute. Nevertheless, there are likely to be large areas where there is considerable potential for rapid agricultural growth. These need to be identified and exploited. As our surplus village (Prey Veng) has shown, this will undoubtedly have a profound impact on household food security. It may also be pointed out that irrigated agriculture is not yet well-developed. In areas such as Kompong Speu, for example, ground-water conditions are known to be good but the lack of adequate technology has so far prevented their potential from being exploited.

The Land Question
The whole land question requires careful review and evaluation. The levels of inequality found in all three areas studied is alarming, especially in the context of land abundance and recent land reforms. Despite the fact that large tracts of high quality agricultural land remain in disuse (due to land mines) and the misappropriation of huge areas of land by the military and foreign interests, there is still some opportunity here to ensure fair and reasonable access

to this vital resource. A systematic investigation needs to be initiated, beginning with a thorough review of the last land reform, the existing situation with regard to access to land, the amount of land that is held by various agencies of the state and so on, with the ultimate aim of putting in place a coherent and effective land policy aimed at maximising rural welfare.

Common Property Resources

The increasing pressure on common property resources and recent changes in the regulatory regime that have been introduced is another area that requires careful scrutiny. The intensification of pressure is related to a growing subsistence constraint, but it also has serious implications for the environment, so that exploitation of common property resources needs to be carried out on a sustainable basis. The imposition of restrictions prevents ease of access to common property resources but at the same time takes away an important balancing mechanism that has served rural society so well during the Khmer Rouge period and continues to play a critical role, especially for those living in more adverse agro-ecological habitats.

Credit

Rural financial intermediation is primarily of the informal kind, of which there is a bewildering variety of forms in evidence, ranging from conceptually simple types to highly complex transactions sitting aside several inter-linked markets—resulting in high rates of interest or grossly under-valued labour services. Despite the high cost of credit that households, especially poor households, face, this is often the only means available in the event of an emergency. However, the longer term costs of such short-term benefits can be large and are frequently unsustainable. State-mediated formal/institutional sources of credit are scarce, while some NGOs are just beginning to venture into this area. However, even the NGO-mediated credit is often priced at around 5 percent a month, which is considered cheap by local standards. There is a clear case here for vigorous state and NGO intervention in rural financial markets that would lower interest rates and generally ease the credit constraint faced. There is a great deal of experience with regard to micro-credit interventions in the region which could be tapped fruitfully.

The Health Dimension

This study has identified the health dimension as a central element in the food security equation of rural households. This dimension manifests itself in at least two ways. At one level, it refers to the high frequency and incidence of illnesses in rural society, leading to high levels of expenditures on medication and treatment. This is seen to be a considerable burden on all households but especially so on the poor, often encouraging asset sales and recourse to usurious credit. At another level, the trade-off between expenditures on health with those on food or agricultural inputs (needed to produce food) is acute. Once again, this is an area requiring concentrated state attention by way of setting up the necessary health infrastructure as well as adequate water and sanitation facilities.

Education

There is a widespread belief that proper education and awareness building about nutrition and good eating practices would contribute to improved food security (Tickner 1996). This study has not been able to address this issue and leaves it for future research. However, the role of human capital development through education and skills training could prove very important. This would be one way of compensating for the lack of assets. The chances are that the primary beneficiaries of interventions in this area would tend to be the non-poor.

Targeted Interventions

This is fashionable, and in theory at least cost-effective, and thus enjoys considerable favour with the donor community. The ability to effectively target however, depends on the ease with which vulnerable households can be identified. If enough resources are invested, all vulnerable households could be identified in a given geographical area. But since this is rarely possible, it would help if large concentrations of vulnerable households, if these exist, could be located quickly and easily. Although a poverty mapping exercise along the lines of the one conducted by the World Food Programme is useful, it suffers from the fact that it seems to equate production (of rice) with food security. A more relevant method needs to be developed, taking into consideration the agro-ecological location and the situation with respect to asset ownership, housing, health and indebtedness. An approach that uses participatory techniques is likely to be more effective as well as faster.

The areas of policy discussed above, must essentially be seen in terms of a phased approach, where interventions in credit and health would form a short- to medium-term strategy, along with policies generally supportive of agricultural growth, while developing a land policy or arriving at an appropriate regulatory framework for common property resources or the introduction of a human resources development strategy are likely to be placed in a longer-term perspective. Ultimately, the problem of infrastructure and institutions must be addressed. Whether it is food, credit or any other input that needs to be delivered to rural society, a prerequisite is the existence of suitable development institutions for the job. At present, local level state apparatus is non-existent, while NGOs are still skirting the literal high ground, close to main transport arteries and safe havens—hardly the areas where one would look for the most insecure in terms of food and nutritional status.

Appendix One

Note on Socio-Economic Classification of Households

It is often important to be able to classify rural households into socio-economic categories. This serves both a descriptive as well as an analytical purpose, since frequently in the social sciences we are interested in who has what and who gets what in terms of resources and privileges. The basis of any classification is usually some notion of wealth. Thus, in nomadic societies animal assets usually determine wealth and prosperity, while in settled agricultural societies access to productive land is often the most critical determinant of wealth. Given Cambodia's agrarian character, access to productive land would certainly be important. However, this conclusion needs to be tempered by the fact that unlike some other countries of Asia, there is an apparent abundance of land in Cambodia and access is often determined by the ability to clear and settle communal lands. Furthermore, a land redistribution programme was carried out by the state in the late 1980s, based on (among other criteria) the number of adults and children in a household. All these factors suggest that, even though access to land remains crucial, it is perhaps not as unequal as in other countries of the region and sub-region. Household stratification based purely on land ownership could therefore be misleading. This is why we experimented with a large number of variables, and in the end proposed that five kinds of variables need to be examined: land ownership, animal assets, machinery and durables, housing and accommodation, and family labour supply. Each of these need to be assigned a rank (we have suggested ranking these on a scale of 1 to 6, with 1 being the lowest). Explicit weights were *not* used to add up or combine the variables—this was deliberately left non-explicit and made a function of the overall assessment of the field researchers, key respondents and co-villagers as well as the respondents themselves. As more and more village studies are conducted, and a better idea is formed about the process of rural stratification in Cambodia, it may be possible to assign weights, but for the time being this is probably inadvisable.

1) Ranking of Variables

Land

A basic benchmark was assumed in terms of a rice consumption requirement of 300 kg per capita per year. In order to produce this rice, the amount of land that would be needed in irrigated areas is 0.10 hectares per capita, and for non-irrigated areas 0.20 hectares per capita. This was given a rank of 4 (marginal positive). Thus:

6 +++ 0.30 hectares per capita in irrigated areas; 0.60 hectares in non-irrigated areas;
5 ++ 0.20 hectares and 0.40 hectares per capita;
4 + 0.10 hectares and 0.20 hectares per capita;
3 - 0.075–0.9 hectares and 0.15—0.18 hectares per capita;
2 -- 0.03–0.06 hectares and 0.06–0.12 hectares per capita;

1 --- less than 0.02 hectares and less than 0.04 hectares per capita.

Animals

The benchmark value of animal assets was assessed at 400,000 to 900,000 riels ($1 at the time of the study was equal to 2,700 riels). Thus:

6 +++ total animal assets worth over 1.75 million riels;
5 ++ total animal assets worth from 900,000 to 1.75 million riels;
4 + total animal assets worth from 400,000 to 900,000 riels;
3 - total animal assets worth from 50,000 to 400,000 riels;
2 -- total animal assets worth from 10,000 to 50,000 riels;
1 --- total animal assets worth less than 10,000 riels.

Machinery and Durables

6 +++ assets worth more than seven million riels (exemplified by ownership of a tractor, a motorcycle, oxcart, rice mill, television, etc.);
5 ++ assets worth from one million to seven million riels (exemplified by ownership of a motorcycle, rice mill or boat with an engine, irrigation pump, television, radio-cassette player, etc.);
4 + assets worth from 500,000 to one million riels (exemplified by ownership of an irrigation pump, oxcart or boat with an engine, plus television, bicycle, battery (for lighting, television), plough, etc.);
3 - assets worth from 150,000 to 500,000 riels (exemplified by ownership of a bicycle, plus a battery (for lighting, television), plough, radio, etc.);
2 -- assets worth from 50,000 to 150,000 riels (exemplified by ownership of a bicycle, or boat, battery (for lighting, television) or radio, etc.);
1 --- assets worth less than 50,000 riels.

Housing

6 +++ house size: 6 metres x 8 metres, with tile roof and wooden walls (with a value of around 6 million riels);
5 ++ house size: 5 metres x 7 metres, with zinc or thatch roof and bamboo walls (with a value of between 3 and 5 million riels);
4 + house size: 4 metres x 6 metres, with thatch roof and bamboo or thatch walls (with a value of between 500,000 and 1 million riels);
3 - house size: 4 metres x 5 metres, with thatch roof and bamboo or thatch walls (with a value of between 300,000 and 500,000 riels);
2 -- old, dilapidated house;
1 --- old and run-down house and precarious living conditions.

Labour Supply

The benchmark level is an earner-dependent ratio of 1:2. Thus:

6 +++ all household members are earners, no dependants;
5 ++ at least one extra earner over and above that dictated by the benchmark ratio;
4 + sufficient (benchmark) labour availability;
3 - up to two extra dependants (aged under 16 or over 55);
2 -- from three to five extra dependants;
1 --- more than five extra dependants.

Appendix Two

Basic Characteristics of the Study Villages

1) Choice of Areas

The choice of the study areas was influenced by a number of considerations: geographical or agro-ecological, rice production and surplus-deficit levels, the situation with regard to safety and security so it would be possible to remain in the areas for a prolonged period, and management/supervision costs.

Geo-morphologically, Cambodia is divisible into: 1) the central Mekong Basin and Tonle Sap flood plain; and 2) the periphery of the basin and the mountainous regions on three sides of the country. The former comprises the main rice growing areas, within which four agro-ecological zones can be identified:[1] 1) wide, inundated plains around the Tonle Sap and the Mekong delta; 2) ancient alluvial terraces; 3) river banks and levees; and 4) swampy zones and lakes behind the levees. Our three study areas fall in one of the first three categories.

In terms of rice production surplus/deficit, a rice surplus area was chosen in Prey Veng province, where there was an estimated surplus of 91 kg per capita in 1995–96 (FAO/ WFP 1996). This an area of flood-recession rice where cultivation of modern rice varieties is extensive, along with the use of pumping machines, tractors and threshers. By way of contrast, a village was chosen from the province of Kompong Speu, which is a rice deficit area. Per capita deficit in 1995–96 was 9 kg for the province as a whole. Traditional rice varieties are cultivated under uncertain rain-fed conditions. The village chosen in Kandal province provides a third dimension. It is a fishing village situated along the banks of the Mekong and is deeply inundated for six months of the year. Rice cultivation is an important activity, with modern practices making significant inroads. The area remains deficit in rice production.

Security and logistics were also important considerations in area selection. Despite these limitations, however, the three areas represent a wide range of agro-ecological and socio-economic conditions that are likely to prevail over large parts of the country.

2) Education

Literacy rates are generally higher for males. Similarly, literacy levels and rates are higher for male heads of households compared to female heads. The percentage of children aged between six and 17 who have received no schooling is strikingly high, at around 40 percent in the three areas. This percentage is higher for girls than for boys.

Table A2.1. Basic Characteristics

[1] See World Bank (1996).

	Prey Veng	Kompong Speu	Kandal
Location	Babaong village in Babaong commune (Peam Ro district) 17 km from Neak Loeang	Trapeang Prei village in Ksem Ksan commune (Odong district) 3 km west of Odong	Prek Kmeng village in Prek Kmeng commune (Lvea Em district) 30 km east of Phnom Penh
Demographic data			
Total population	2,166	341	1,433
Sample population	509	341	456
Total households	462	64	253
Sample households	100	64	80
Family size	5.07	5.33	5.66
Female-male (%)	54.2	50.1	51.3
Children under 12 (%)	41.7	43.7	47.6
Land types	Shallow flooding	Upland area	Deeply flooded
Agriculture	Rice is the main crop; only 0.4 percent of land used for non-rice crops; 90 percent of rice is HYV	Rice accounts for 95.0 percent of the land, watermelon 2.4 percent; maize 1.5 percent; sweet potato 0.8 percent	Rice accounts for 67.4 percent of the land; with maize at 20.3 percent and reeds at 9.8 percent; lotus accounts for 2.4 percent
Technology	Water pump use is widespread; 30 percent of farmers have access to tractors or tillers	Traditional technology is used for local rice varieties	Expanding irrigation and HYV cultivation
Socio-economic			
Land owned	0.28 hectares per capita	0.15 hectares per capita	0.17 hectares per capita
Living space	25.9 square metres per household	31.4 square metres per household	34.8 square metres per household
Occupation	farming	farming and palm-sugar manufacturing	fishing, fish processing and farming
Education of head	3.47 years	3.14 years	4.87 years
Female headed (%)	29.0	15.0	12.5
Development programmes	WID, HEKS, MCC, UNICEF, OXFAM (well-digging, sanitation, credit)	GRET (credit)	Ministry of Women's Affairs, UNICEF (credit)
Health care	Nearest health centre 17 km away	Three heath workers and two volunteer workers; no clinics	Community health centre
Drinking water	21 hand pumps/water wells; four ponds	rain water and small hand-dug wells	Two hand pumps, reliant on river and lake water
Schools	Two schools with 473 students	No school; nearest school 3 km away	One primary school
Markets	none	none	none
Wats	two	none	one

3) Access to Common Property

Access to common property plays a critical role in the survival matrix of rural Cambodian households. There are clear indications, however, that access is getting more difficult over time, since people have to spend longer hours and travel further to collect firewood, food and other raw materials than they used to. Also, the number of people who are dependent on

hunting and gathering is increasing quickly, leading to fears of rapid depletion of fish, birds and other animals.

4) The Role of Children

Both boys and girls are active in helping with family work, including collection of firewood and looking after animals, helping in retailing, processing etc. There is a small gender division of labour here, with boys tending to be more active in firewood collection and looking after cattle, while girls help with food processing and retailing. There appears to be a trade-off between the economic activities of children and school attendance/enrolment. The large percentage of children who were found to have had no schooling is symptomatic of this.

5) Migration

Strong indications of seasonal migration were seen, especially in the rice-deficit village. Both push as well as pull factors were operative. The push factors originate in low employment levels, meagre opportunities and high seasonalities, while the pull factors relate to a construction boom in urban areas that has been occurred since the 1993 national election. Significant migration was also seen in the fishing village, especially when flooding was extensive and there were few opportunities for work locally. In the rice-surplus village, reverse migration was in evidence, with an inflow of labourers from outside, especially those seeking agricultural work and work moving earth.

Appendix Three

Additional Data on Food Security

Table A3.1. Households by Per Capita Calorie Groups (percentage)

	Prey Veng	Kompong Speu	Kandal
Less than 1,000 calories	2.0	30.0	33.8
1,000–1,400 calories	31.0	16.7	13.8
1,400–1,700 calories	24.0	10.0	11.3
1,700–2,000 calories	32.0	8.3	7.5
More than 2,000 calories	11.0	35.0	33.8

Table A3.2. Rice Production per Capita per Year, 1996–97 (kg)

	Prey Veng	Kompong Speu	Kandal
Very poor	-	41.3	-
Poor	488.9	180.4	261.5
Marginal (negative)	703.0	196.4	354.2
Marginal (positive)	114.8	183.0	378.5
Well-off	1,554.0	236.0	467.8
Rich	1,388.0	358.0	-
Average	1,265.0	194.6	375.2

Table A3.3. Non-Rice Expenditures and Calories by Class

	Prey Veng		Kompong Speu		Kandal	
	Calories per adult unit	Riels per adult unit	Calories per adult unit	Riels per adult unit	Calories per adult unit	Riels per adult unit
Very poor	119.0	227.0	417.0	813.0	410.0	304.0
Poor	180.0	399.0	335.0	603.0	373.0	430.0
Marginal (neg.)	183.0	465.0	281.0	1,274.0	415.0	338.0
Marginal (pos.)	272.0	447.0	165.0	669.0	573.0	504.0
Well-off	273.0	570.0	298.0	593.0	613.0	1,024.0
Rich	276.0	596.0	128.0	814.0	668.0	-
Average	254.0	510.0	298.0	718.0	524.0	499.0

Table A3.4. Alternative Poverty Estimates: Head Count Index Ratios

	Prey Veng	Kompong Speu	Kandal
Poor (A)	9.0	40.0	33.8
Poor (B)	18.0	46.3	43.8
Poor (C)	10.0	37.0	34.0
Calorie-based estimate	37.0	47.0	48.0
Income-based estimate	43.0	50.0	48.0

Poor (A) includes the poorest two categories in our household classification system; Poor B includes "marginal (negative)" in addition to Poor (A); Poor C is based on the responses of key informants; the other estimates are from Table 3.6 (page 23).

Table A3.5: Other Indicators of Food Security Status

Indicator	Prey Veng	Kompong Speu	Kandal
1. Need to buy rice (average number of months)	2.3	5.4	7.5
2. Paddy rice stock (kg, average all households)			
Round 1	1,528	92	160
Round 2	245	587	39
3. Paddy rice stock (kg, round 2)			
Surplus households	328	1,244	150
Deficit households	60	471	16
4. Other food stocks (riels, avg. all households)			
Round 1	856	4,800	3,400
Round 2	18,200	54,300	5,600
5. Rice sold (percentage)	37	1	42
Surplus households	39	19	55
Deficit households	33	-	37
6. Food frequency (percentage of households, sufficient to last one week)			
Meat	62	42	23
Fish	100	100	100
Other protein	31	85	35
Fruit	31	45	75
Vegetables	100	87	100
7. Additional income (10,000 riels, percentage of households)			
Protein	52	30	86
Rice	32	12	10
Repayment	-	47	-
8. Visible malnutrition			
Children with large stomachs	12	13	-
Night blindness	11	7	5
Other (oedema, anaemia)	25	7	12
9. Distress symptoms (percentage of households)			
Heavy reliance on common property resources	20	-	-
Consumption loans	12	43	49
Distress migration	9	-	-
Rice porridge	7	13	19
Distress sale of assets	-	-	24
10 Secondary distress symptoms[a] (percentage of households)	13	45	88
11. Tertiary distress symptoms[a] (percentage of households)	-	27	61

a These include sale of assets, migration, sending children to work, etc.

Figure A3.1. Total Calories per Adult Unit Equivalent (all areas, second round)

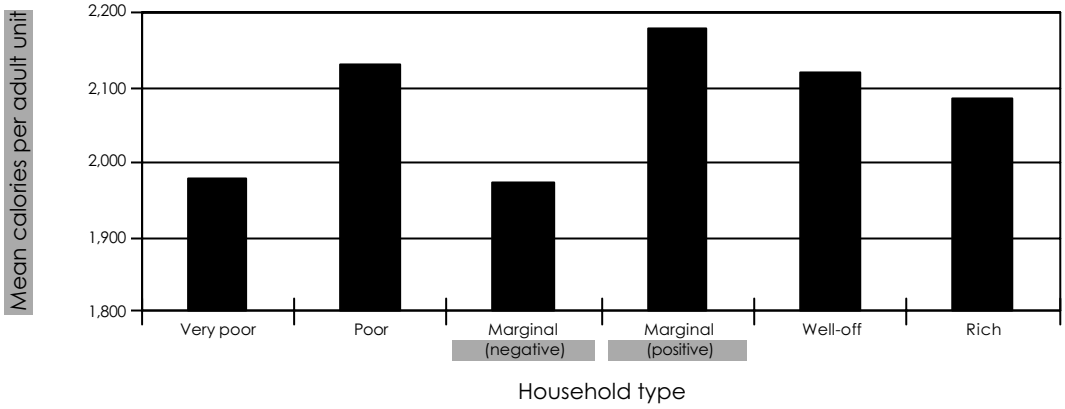


Figure A3.2. Non-Rice Calories per Adult Unit Equivalent (Prey Veng)

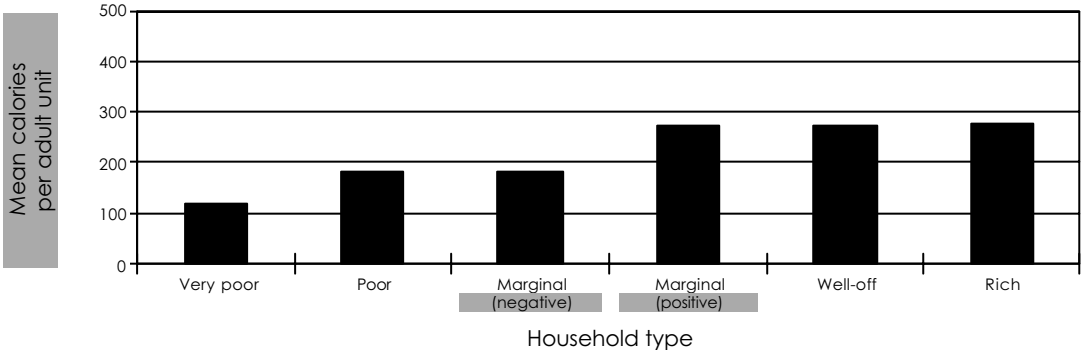


Figure A3.3. Non-Rice Calories per Adult Unit Equivalent (Kandal)

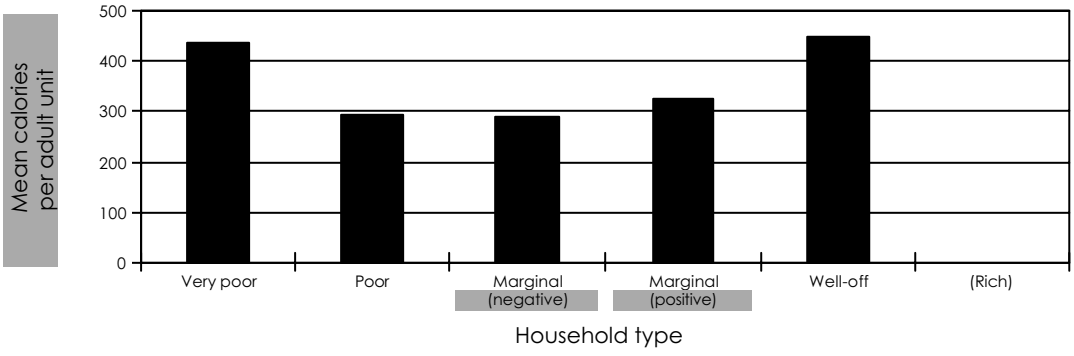
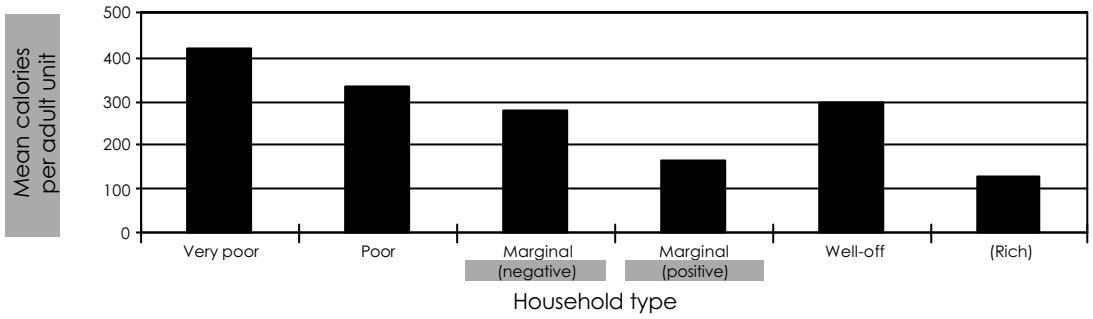


Figure A3.4. Non-Rice Calories per Adult Unit Equivalent (Kompong Speu)



1) Statistical Note

Variation in Consumption: Some Regression Results

A Probit regression estimate was attempted to explain household location in terms of calorie intake above and below a threshold point (of 2,000 calories per capita) in terms of rice production, socio-economic class and dummies for sex of the head of household and areas. The estimated equation is reported below:

$$CAL\_DUM = -2.7 + 0.08\ PCRi + 0.06\ FEM\_HD + 0.41\ DPOOR + e$$
$$(0.32) \qquad (0.40) \qquad (2.9)$$

where *CAL_DUM* is calorie intake dummy, with an intake level of more than 2,000 per capita equalling 1, otherwise equalling 0; *PCRi* is per capita rice production; *FEM_HD* is a dummy variable for female-headed household (female-headed = 1, otherwise = 0); and *DPOOR* is classes 1 to 3 equals 0, otherwise equalling 1.[1]

The only variable to prove significant was *DPOOR*, with a coefficient of 0.41. This can be interpreted as follows: if a household moves from classes 1, 2 or 3 (the poor classes) into the non-poor classes, then the probability that it will have a calorie intake of more than 2,000 calories per capita is 41 percent.

Compared to the relatively poor performance of the model in explaining calorie intake variation, a simple OLS model with food expenditures as the dependent variable performs much better. Thus we have:

$$log\ food = 5.64 + 0.14\ log\ inc + 0.10\ log\ PCR + 0.34\ KSDUM + e$$
$$(3.27) \qquad (3.83) \qquad (5.01)$$

$$R\text{-}Square\ (adj) = 0.20;\ F = 16.6$$

where, *food* = food expenditures per day per adult unit (in riels); *inc* = income per day per adult unit; *PCR* = per capita rice production per day; and *KSDUM* = a dummy for Kompong Speu (which appears to exhibit some unusual ceremonial consumption expenditures).

The model performs well and the coefficients are all significant. The income elasticity of demand for food is estimated at 0.14 (*i.e.* an increase of incomes by 1 percent will lead to an increase in food expenditures of 0.14 percent—suggesting a relatively inelastic situation).

The results of the two models show that, though calories are similar across income groups over a wide range, this is not true for food expenditures. In other words, the same level of calories can be obtained through different combinations of cheap and more expensive foods, and this is sensitive to class and region.

[1] Chi-Square Goodness-of-Fit was significant.

Appendix Four

Additional Data on Income Distribution

Figure A4.1. Agricultural Income by Class (Prey Veng)

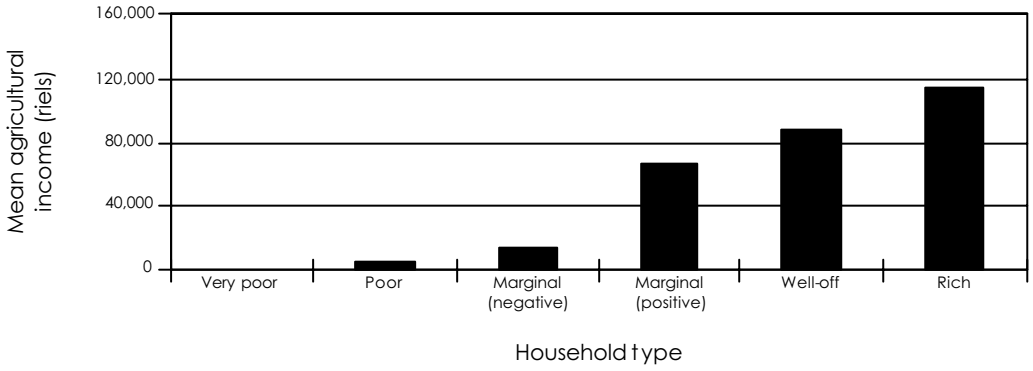


Figure A4.2. Agricultural Income by Class (Kompong Speu)

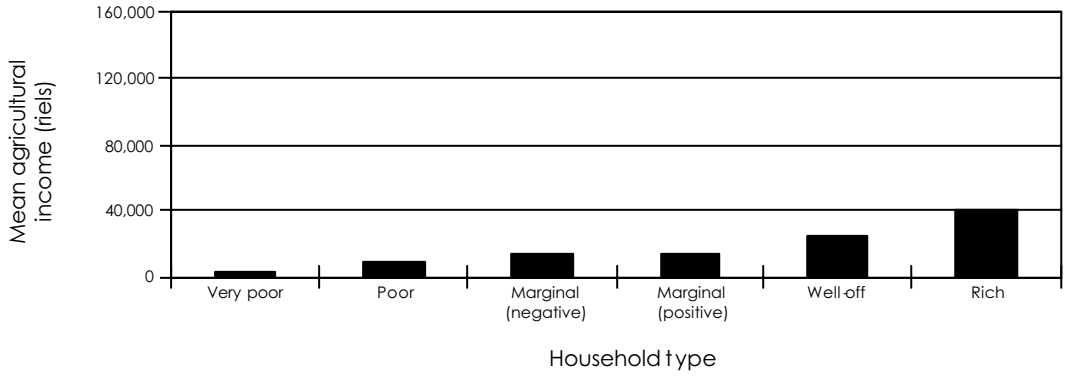


Figure A4.3. Agricultural Income by Class (Kandal)

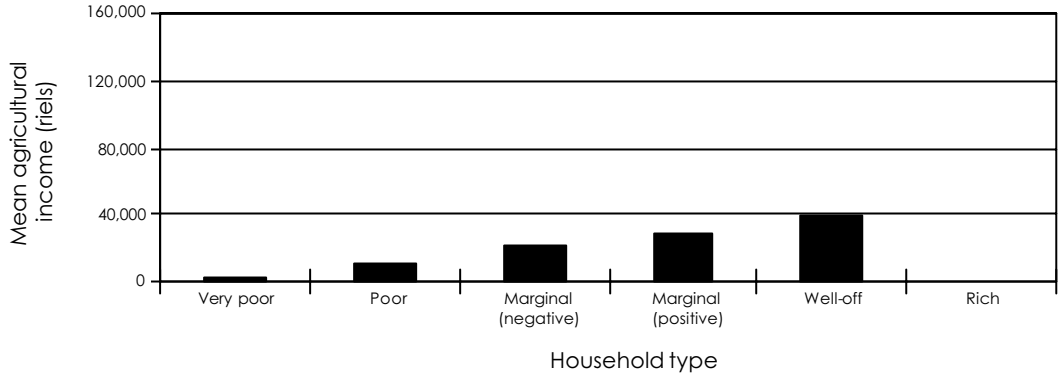


Figure A4.4. Non-Agricultural Income by Class (Prey Veng)

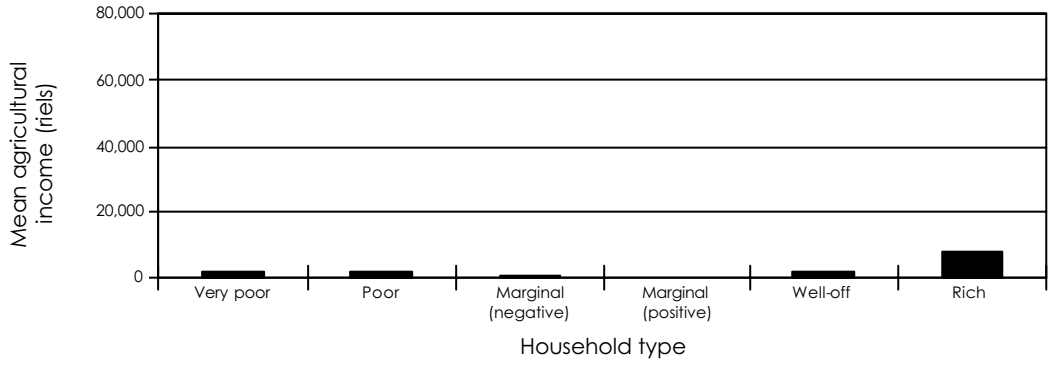


Figure A4.5. Non-Agricultural Income by Class (Kompong Speu)

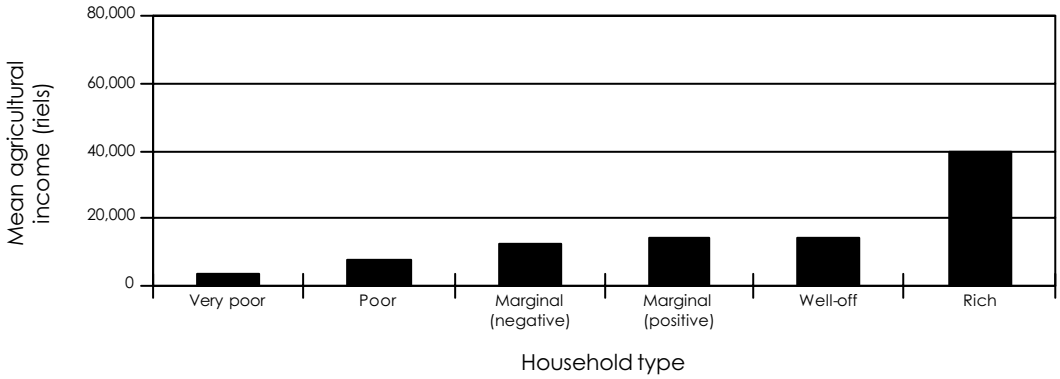


Figure A4.6. Non-Agricultural Income by Class (Kandal)

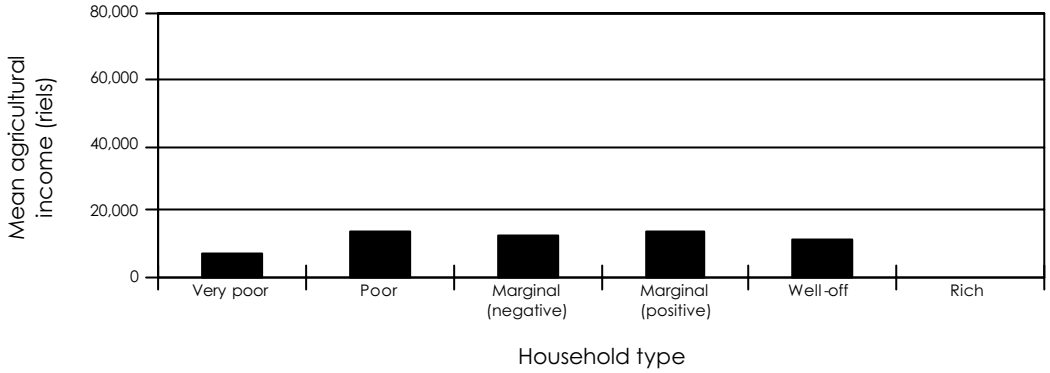


Figure A4.7. Female Labour Earnings by Class (Prey Veng)

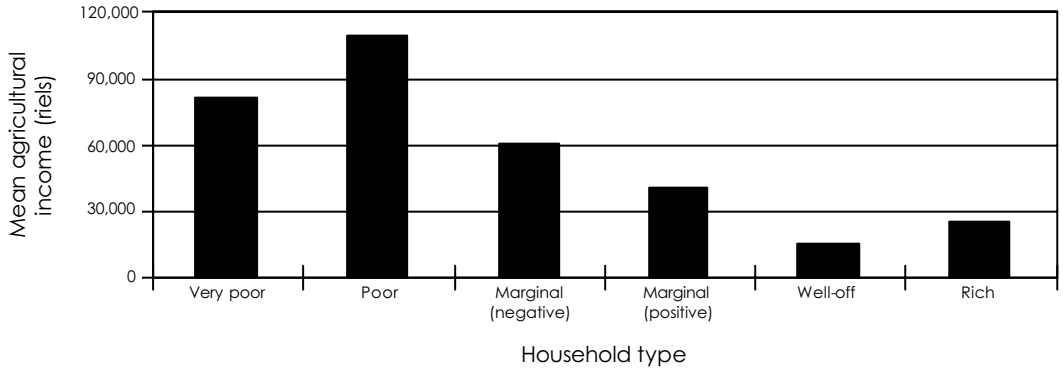


Figure A4.8. Female Labour Earnings by Class (Kompong Speu)

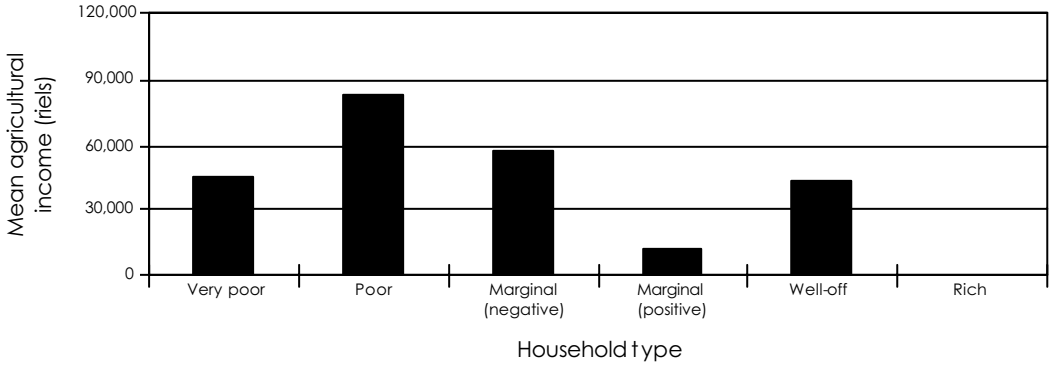
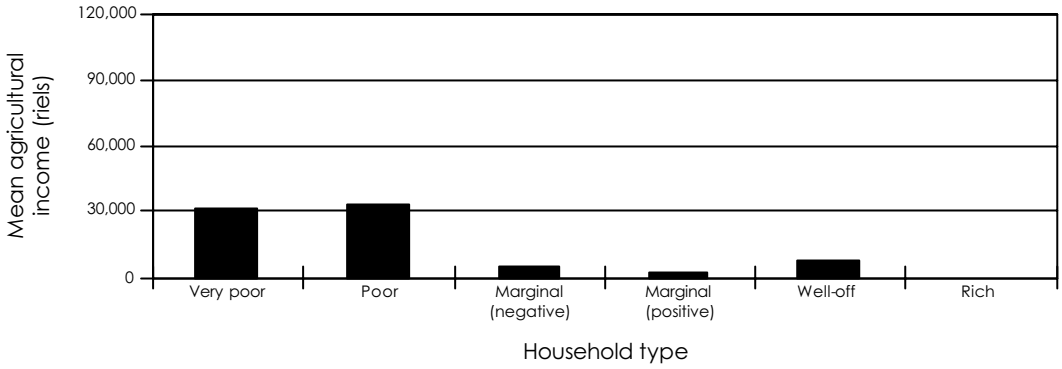


Figure A4.9. Female Labour Earnings by Class (Kandal)



Appendix Five

Additional Data on Asset Distribution

Figure A5.1. Distribution of Animal Assets by Class (all three villages)

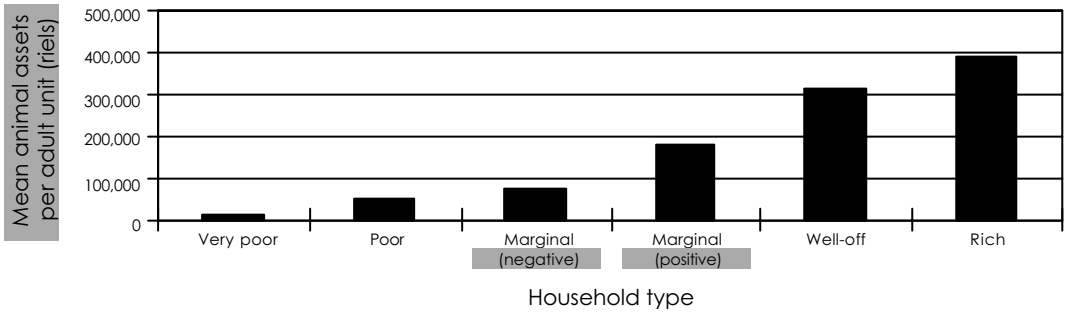


Figure A5.2. Distribution of Other Assets by Class (all three villages)

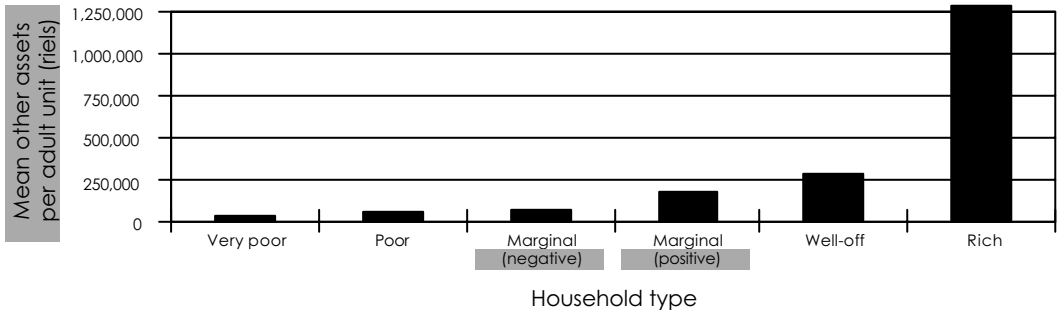


Figure A5.3. Distribution of Animal Assets by Class (three villages)

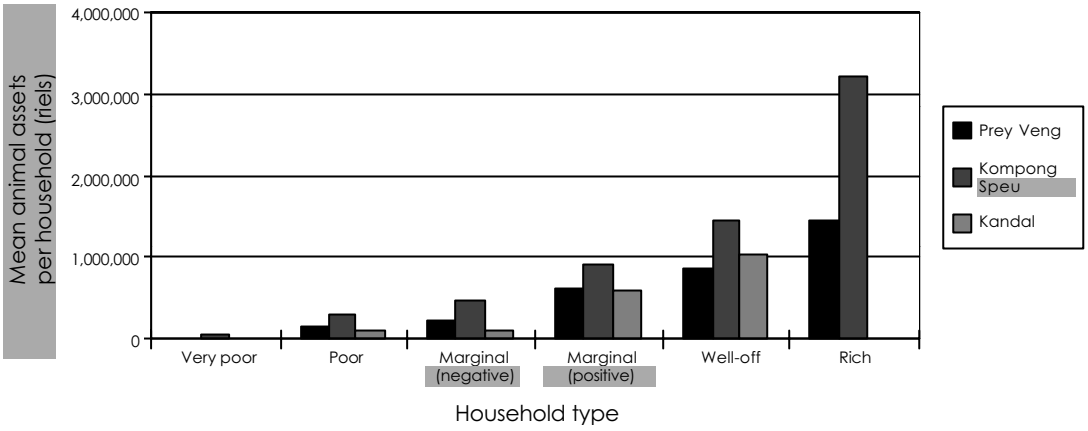
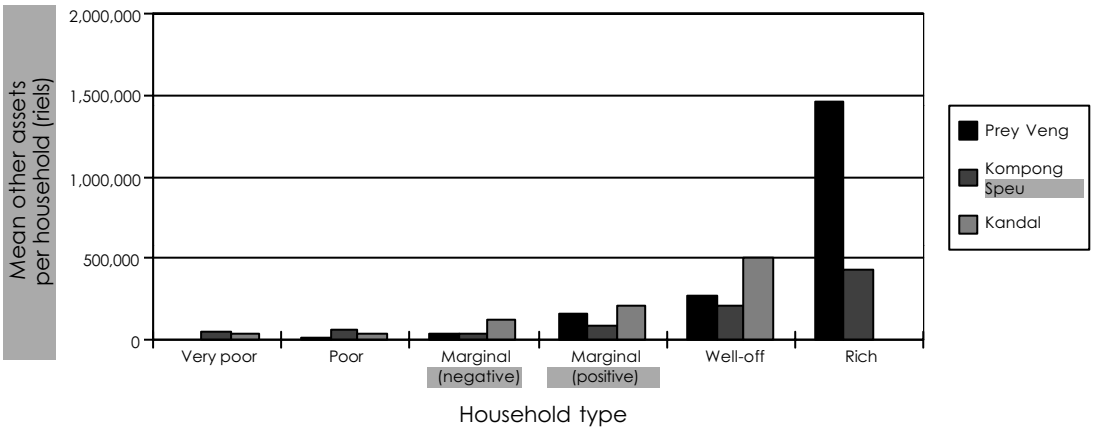


Figure A5.4. Distribution of Other Assets by Class (three villages)



Appendix Six

Additional Data on Market Participation

Figure A6.1. Outstanding Credit for Indebted Households (all three villages)

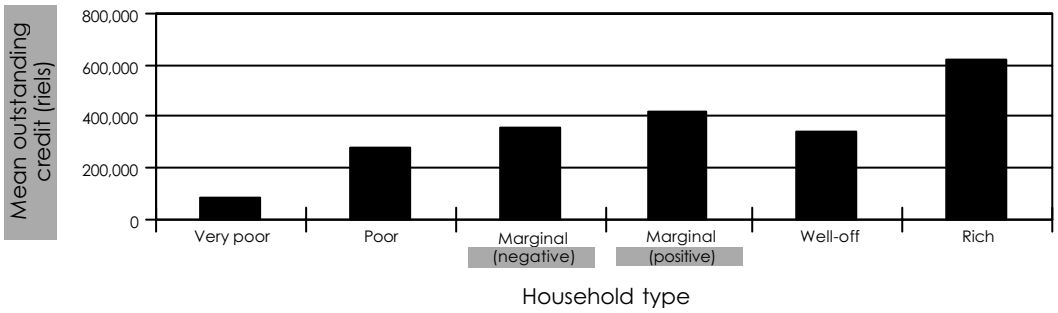


Figure A6.2. Outstanding Credit for All Households (all three villages)

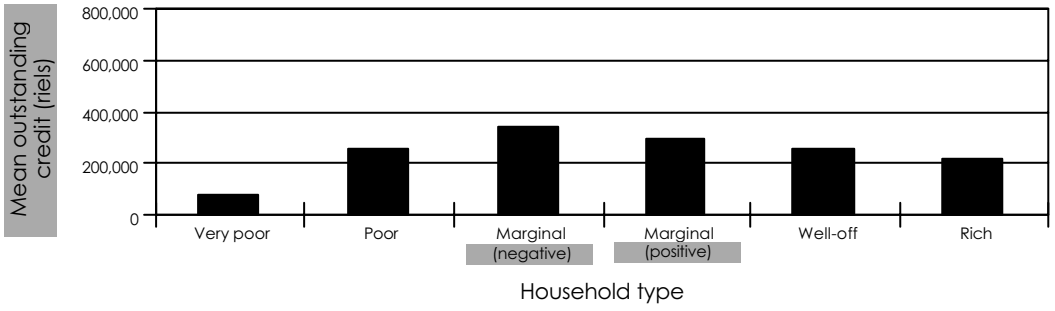


Figure A6.3. Cash Loans of Borrowing Households in Past Four Months (all three villages)

Figure A6.4. Borrowing of All Households in Past Four Months (all three villages)

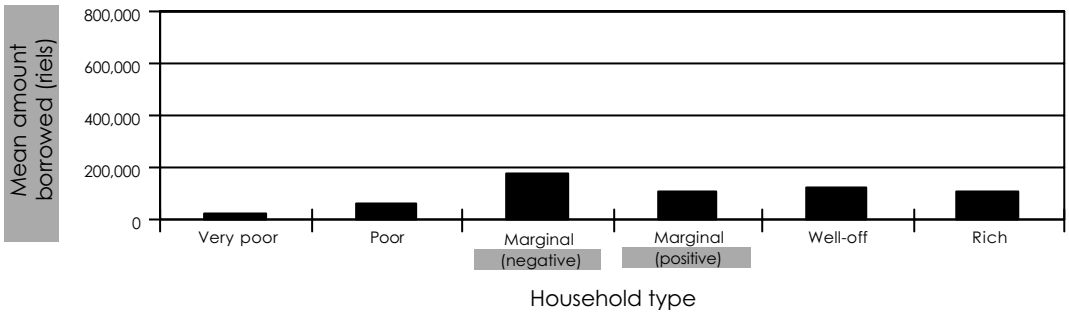


Table A6.1. Outstanding Credit per Household in Prey Veng (riels)

	Credit outstanding in borrowing households	Credit outstanding in all households	Borrowing households (percentage)
Very poor	115,000	115,000	100.0
Poor	151,800	151,800	100.0
Marginal (negative)	301,250	267,777	88.9
Marginal (positive)	374,500	249,666	66.7
Well-off	477,409	308,911	64.7
Rich	853,333	243,809	28.6
Male head of household	434,349	266,814	61.4
Female head of household	365,800	243,866	66.6
Average	412,587	259,930	63.0

Table A6.2. Outstanding Credit per Household in Kompong Speu

	Credit outstanding in borrowing households	Credit outstanding in all households	Borrowing households (percentage)
Very poor	67,777	55,454	81.8
Poor	201,292	185,807	92.3
Marginal (negative)	132,000	132,000	100.0
Marginal (positive)	132,500	132,500	100.0
Well-off	139,333	132,000	94.7
Rich	150,000	112,500	75.0
Male head of household	137,068	125,645	91.7
Female head of household	152,045	139,375	91.7
Average	140,063	128,392	91.7

Table A6.3. Outstanding Credit per Household in Kandal

	Credit outstanding in borrowing households	Credit outstanding in all households	Borrowing households (percentage)
Very poor	120,000	100,000	83.3
Poor	368,611	315,952	85.7
Marginal (negative)	556,625	556,625	100.0
Marginal (positive)	536,038	366,763	68.4
Well-off	527,000	301,142	57.1
Rich	-	-	-
Male head of household	493,600	382,366	77.5
Female head of household	97,500	65,000	66.6
Average	454,639	346,662	76.3

Table A6.4. Amount Borrowed per Household in Past Four Months in Prey Veng (riels)

	Amount borrowed in borrowing households	Amount borrowed in all households	Borrowing households (percentage)
Very poor	20,000	10,000	50.0
Poor	114,750	91,800	80.0
Marginal (negative)	235,714	183,333	77.8
Marginal (positive)	223,588	140,777	63.0
Well-off	291,277	154,206	52.9
Rich	695,000	132,381	19.0
Male head of household	314,783	166,386	52.9
Female head of household	155,067	77,533	50.0
Average	268,711	139,730	52.0

Table A6.5. Amount Borrowed per Household in Past Four Months, Kompong Speu (riels)

	Amount borrowed in borrowing households	Amount borrowed in all households	Borrowing households (percentage)
Very poor	16,000	13,090	81.8
Poor	170,937	105,192	61.5
Marginal (negative)	90,000	54,000	60.0
Marginal (positive)	63,800	39,875	37.5
Well-off	65,000	10,263	-
Rich	-	-	-
Male head of household	82,285	36,000	43.7
Female head of household	81,071	47,291	58.3
Average	81,982	38,258	46.7

Table A6.6. Amount Borrowed per Household in Past Four Months in Kandal (riels)

	Amount borrowed in borrowing households	Amount borrowed in all households	Borrowing households (percentage)
Very poor	62,000	51,667	83.3
Poor	82,000	39,048	47.8
Marginal (negative)	396,000	247,500	62.3
Marginal (positive)	421,000	110,789	26.3
Well-off	526,250	300,714	57.1
Rich	-	-	-
Male head of household	284,394	132,183	46.5
Female head of household	40,000	4,444	11.1
Average	277,206	117,812	42.5

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