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Comprehensive Food Security & Vulnerability Analysis (CFSVA)

CAMBODIA

WFP World Food Programme

Kingdom of Cambodia: Comprehensive Food Security and Vulnerability Analysis (CFSVA)
December, 2008

Prepared by Paolo Santacroce
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All Annexes are available on the CD provided with the report.

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CURRENCY EQUIVALENTS, ACRONYMS AND ABBREVIATIONS

Currency equivalent (December 2008): Currency unit 1 US$ = 4,082 Riels

Acronyms and Abbreviations

ADB	Asian Development Bank
AIDS	Acquired immune deficiency syndrome
ASEAN	Association of South East Asian Nations
CARD	Council for Agricultural and Rural Development
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CI	Confidence interval
CPI	Consumer Price Index
CCA	(UN) Common Country Assessment
CCC	Cooperation Committee for Cambodia
CCLS	Cambodia Child Labour Survey
CDC	Council for the Development of Cambodia
CDHS	Cambodia Demographic and Health survey
CDRI	Cambodia Development Resource Institute
CDMG	Cambodia Millennium development Goals
CSES	Cambodia Socio-Economic survey
FAO	United Nations Food and Agriculture Organization
FCG	Food Consumption Group
FCS	Food Consumption Score
FFW	Food for Work
FIVIMS	Food Insecurity and Vulnerability Information and Mapping System
GDP	Gross Domestic Product
HHQ	Household questionnaire
HIV	Human immunodeficiency virus
LDC	Least Developed Country
LGP	Length of growing period
M&E	Monitoring and evaluation
MAFF	Ministry of Agriculture, Forestry and Fisheries
MCH	Maternal and Child Health
MEF	Ministry of Economy and Finance
MOEYS	Ministry of Education, Youth and Sport
MOH	Ministry of Health
MOI	Ministry of Interior
MOP	Ministry of Planning
MOT	Ministry of Tourism
MOWA	Ministry of Women's Affairs
MOWRAM	Ministry of Water Resource and Meteorology
MRD	Ministry of Rural Development
NBC	National Bank of Cambodia
NIS	National Institute of Statistics
NSDP	National Strategic Development Plan
PCA	Principal Component Analysis
PRRO	Protracted Relief and Recovery Operation
RGC	Royal Government of Cambodia
SD	Standard deviation
SEA	South East Asia
SFFSN	Strategic Framework for Food Security and Nutrition
SFP	School Feeding Programme
US$	United States Dollar

UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UXO	Unexploded ordnance
VCL	Village check list
TWG-PPR	Technical Working Group-Planning and Poverty Reduction
WB	World Bank
WFP	United Nations World Food Programme
WHO	United Nations World Health Organization

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EXECUTIVE SUMMARY

Objectives of the food security and vulnerability study

The overall objective of the Comprehensive Food Security and Vulnerability Analysis (CFSVA) is to analyze the food security and vulnerability conditions of population groups and communities, and to provide baseline information to WFP decision makers and other actors focusing on food insecurity.

The specific objectives of the Cambodia CFSVA were as follows:

- Identify geographic and socio-economic groups that are food insecure or vulnerable to becoming food insecure;
- Understand the impact of rising prices on the food security situation of the country;
- Identify the nature and causes of food insecurity among each group;
- Identify the major risks and constraints to improve food security conditions;
- Evaluate assistance needs at the short, medium and long range.

How many people are food-insecure?

Approximately 340,000 households (1.7 million people) were food insecure at the time of the survey. This represents 11 percent of the total population. Four percent of the population is highly food insecure.

The survey gathered food security data for June 2008 (before the lean season). During the lean season (August-November) the proportion of food-insecure households is estimated to increase to approximately 18 percent of the population or 550,000 households (2.8 million people).

Where are the food-insecure?

Overall, 12.5 percent of the households in rural Cambodia are food insecure. Rural areas are more affected by food insecurity than urban areas as more than 90 percent of the food insecure households currently live in rural areas.

Approximately 17 percent of the rural households in the Tonle Sap ecological zone are food insecure (eight and nine percent have poor and borderline food consumption, respectively). In rural areas of the Plateau/Mountain zone 16.5 percent of households are food insecure, though compared to the Tonle Sap zone there is a lower prevalence of households in the poor food consumption group (i.e. 3.5 percent). Approximately nine percent of rural households in the Plains zone are food insecure (three and six percent with poor and borderline food consumption, respectively).

Less than six percent of the households in urban Cambodia are food insecure. They are mostly concentrated in the Plains (nine percent) and in the Plateau/Mountain (10 percent) zones.

It was estimated that the proportion of food-insecure people in Cambodia could increase from 11 to 18 percent in the lean season. The total number of food insecure people is projected to reach 2.5 million in the rural areas. The largest number of potentially food-

insecure people is expected in the Tonle Sap and Plains ecological zones (approximately one million people each or 23 and 16 percent of the population in these areas, respectively), followed by the Plateau (approximately 480,000 people or 26 percent of the population), the Coastal zone (approximately 130,000 people or 12.5 percent of the population). Phnom Penh has the lowest number of potentially food insecure households (nearly 65,000 people or approximately six percent of the population).

Ecological zone	Stratum	Currently food insecure (June 2008)*			Potentially food insecure during the lean season (August-November 2008)*		
		# people	# HHs	%	# people	# HHs	%
Plains	Rural	564,972	112,994	9.4	986,948	197,390	16.6
	Urban	56,609	11,322	8.9	70,541	14,108	11.1
	Total	**621,581**	**124,316**	**9.4**	**1,057,489**	**211,498**	**16.0**
Tonle Sap	Rural	613,385	122,677	17.1	959,205	191,841	26.4
	Urban	64,050	12,810	7.8	63,947	12,789	7.8
	Total	**677,436**	**135,487**	**15.3**	**1,023,152**	**204,630**	**22.8**
Plateau / Mountain	Rural	289,203	57,841	16.5	461,188	92,238	27.2
	Urban	12,066	2,413	10.0	16,052	3,210	13.3
	Total	**301,269**	**60,254**	**16.1**	**477,240**	**95,448**	**26.2**
Coastal	Rural	57,132	11,426	6.7	103,523	20,705	12.5
	Urban	8,466	1,693	4.4	25,349	5,070	12.2
	Total	**65,598**	**13,120**	**6.2**	**128,872**	**25,774**	**12.5**
Phnom Penh	Urban	15,240	3,048	1.4	63,392	12,678	5.7
	Total	**15,240**	**3,048**	**1.4**	**63,392**	**12,678**	**5.7**
Cambodia	Rural	1,524,693	304,939	12.5	2,510,864	502,173	20.7
	Urban	156,431	31,286	5.5	239,282	47,856	8.3
	National	**1,681,124**	**336,225**	**11.1**	**2,750,146**	**550,029**	**18.3**

*Calculations are made using weights for current urban and rural population

Who are the food insecure?

Food consumption: CFSVAs use the Food Consumption Score (FCS) as proxy indicator for current household food security status. The Food Consumption Score was computed to classify households based on their dietary diversity and the number of days a specific food item/group was consumed in the past seven days. The higher the FCS, the higher household's the dietary diversity and frequency of consumption. Chapter 5 reports a detailed description of the analysis on food consumption patterns. Households were then classified into three groups as follows:

- **Poor Food Consumption:** Approximately four percent of the surveyed households belong to this group. These households are highly food insecure. Households in this group rarely consume any animal products and pulses, which are important sources of protein. Rice is consumed on a daily basis while vegetables are consumed two or three days a week. These food consumption factors combined make these households highly susceptible to micronutrient deficiencies.

- **Borderline Food Consumption***:* Seven percent of the surveyed households belong to this category. These households are moderately food insecure. They have low dietary diversity but a slightly higher animal protein intake compared with the poor food consumption households. Borderline food consumption households are highly susceptible to slide into the poor food consumption group as conditions deteriorate.

- **Acceptable Food Consumption:** 89 percent of the surveyed households have acceptable food consumption. These households are considered to have a diet sufficiently diversified and adequate for a healthy life.

An analysis of household cash income and agricultural activities led to the creation of 16 livelihood groups (which are described in detail in Chapter 4)**.** The livelihood groups **most vulnerable to food insecurity** were those who are unable to supplement their incomes from agriculture activities with cash-earning employments. Food insecure households tend to rely on agriculture alone and have a higher prevalence of only one family-member working for cash income compared to food secure households. Often they rely on casual labor activities. These households have limited access to land and have relatively smaller land holdings. They are often highly indebted. Overall, food insecure households have notably higher absentee rates than food secure households (40 percent compared to 22 percent) among children in primary school.

Households with **poor food consumption households** are mainly **rural**. While these rural households are less dependent on fluctuations in market prices, they have fewer resources to cope with food price increases. Households with **borderline food consumption** often depend on fishing, hunting and gathering for their food needs. Increasing restrictions on access to common property resources might thus seriously affect the food security of these households.

What are the causes of insecurity?

Vulnerability and food insecurity result from unequal access to food, basic services, education, health, and land availability. The situation is further exacerbated by a weak distribution system, poor transport infrastructure, unemployment and frequent shocks, such as floods, droughts, and price fluctuations. Chapter 7 provides elements for a causal analysis of the food insecurity in Cambodia.

Unequal access to land: Landlessness and weak land tenure arrangements are serious problems in Cambodia, particularly in the Plateau/Mountain and Tonle Sap ecological zones. About 21 percent of the surveyed households do not have any land. In addition, land is not equally distributed: 10 percent of the landholders own nearly 45 percent of the total farmed land. The survey showed that 40 percent of the landholders did not have title deeds, which restricts their access to credit. The increasing competition for land due to population growth and market consolidation exacerbates this constraint.

Small land plots: Almost half of the households do not own enough land to feed a family of five. In Cambodia, one hectare of land is considered as the threshold to meet the milled rice requirements of a family of five. Yet more than 20 percent of households own plots that are smaller than 0.5 ha. An additional 25 percent have plot sizing between 0.5 and 1 ha.

Remoteness from market: Distance from the market is a serious concern for many villages. Distance to the market outlets increases the transportation costs (particularly in the Plains and Plateau/Mountains ecological zones) and causes dependency on prices dictated by traders (especially for households in the Tonle Sap zone). Only one out of five villages has an easily accessible market while more than 40 percent of the surveyed villages reported that the market is far away. More than half of these disadvantaged villages are in the Plains ecological zone.

High food prices: Cambodia experienced an abnormal increase in the prices of essential goods, mainly food and fuel, in early 2008. According to the National Institute of Statistics, the overall annual inflation rate was 14 percent in January 2008 and 22 percent by July

2008. At the end of April 2008, the peak was mainly due to the increase in the prices of rice (the principal food commodity of Cambodia). The main reasons for the food price increases were as follows: the substantial increase in the prices of farming inputs (fuel and fertilizer); speculation by traders; and poor rice production. Households reported higher food prices as one of their main difficulties during the six months preceding the survey.

These increases were well above the expected seasonal price variation, causing households to employ various coping mechanisms: 22 percent of the households had to rely on cheaper, less preferred foods; 40 percent reduced the quantity of food they ate each day. The worst-off households found solutions by 'increasing exploitation of common property resources'. Increases in exploitation of common resources might be associated with increased environmental degradation through over-fishing and over-grazing. Among the food insecure households there was a high prevalence of households that reported taking children out of school as a frequent coping strategy to face constraints in the access to food. Analysis of the vulnerability context and of the coping strategies is in Chapter 6.

Natural and social hazards: Cambodia is highly prone to both droughts and flooding events: 11 percent of the households are highly exposed to a natural disaster, seven percent to drought and four percent to floods. **Urban households,** who do not produce rice, are particularly exposed to rising food prices.

Recommendations

Food insecurity has a multitude of underlying, intertwined factors that influence and exacerbate one another. Successful strategies thus imply that broad multi-sector and integrated approaches are required to improve food security and reduce the vulnerability of both rural and urban households. Hence, investments in transport infrastructure, interventions in agricultural productivity and crop diversity, and in the service sector, especially education, health, and market developments are all equally needed. In addition, social protection programmes and safety nets targeting the poorest and most vulnerable households should be promoted together with activities to reduce the vulnerability of households living in areas prone to natural disasters such as drought and flooding.

Programmatic recommendations are listed in detail in Chapter 8. These include interventions and a comprehensive strategy in the health and nutrition sector to address malnutrition, particularly among young children and women. Support to rural livelihoods is also needed, particularly for small landholders with limited or any cash income opportunities and restricted access to productive assets, such land and livestock. Efforts to improve the transport and service infrastructures are fundamental for the development of rural areas. In addition, it is necessary to facilitate the establishment of a Food Security Monitoring System able to detect deterioration in the food security conditions of Cambodian households.

1. CFSVA Objectives and Methods

1.1 Objectives

The primary objective of a Comprehensive Food Security and Vulnerability Analysis (CFSVA) is to provide accurate information on food security and vulnerability conditions of population groups and communities to relevant actors focusing on food insecurity. The CFSVA in Cambodia intended to assess levels of household food insecurity in five ecological zones and in urban and rural areas by answering the following questions:

- Who are the food insecure people?
- How many are they?
- Where do they live?
- Why are they food insecure?
- How can external assistance play a role in alleviating the food insecurity situation and what type is needed?

The specific objectives of the CFSVA were as follows:

- Identify **geographic and socio-economic groups** that are food insecure or vulnerable to food insecurity
- Assess the **impact of food price rises** on the national food security situation
- Identify the **nature and causes of food insecurity** among each group
- Identify the major **risks and constraints to improving food security**
- **Evaluate assistance needs** in the short, medium and long term

1.2 Definitions, Terminology and Concepts

At the World Food Summit in 1996, **food security** was defined to exist when *'All people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life*'.

There is no single measure of the level of food insecurity of a population, a community, a household or an individual. Food security is composed of a wide array of interrelated and concurring agro-environmental, socioeconomic and biological factors. To some extent, focusing on three distinct but highly interconnected dimensions of food security can simplify this complexity. These are as follows:

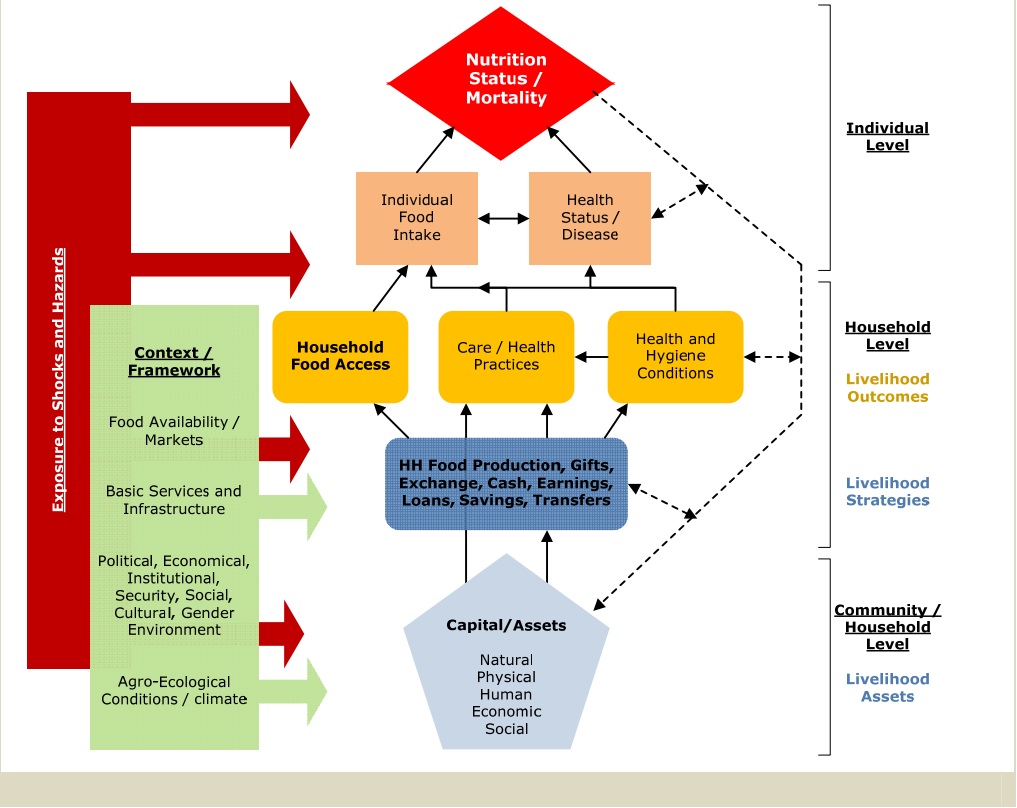
1. **Food availability**, which is the amount of food physically available to a household (micro level) or at the national level (macro);

2. **Food access**, which is the physical (e.g. road network, market) and economic (e.g. own production, exchange, purchase) ability of a household to acquire adequate amounts of food; and

3. **Food utilization,** which is the intra-household use of the food accessible and the individual's ability to absorb and use nutrients (e.g. function of health status).

The three dimensions of food security are the basic elements for the Conceptual Framework that guides the CFSVA and its specific understanding of food security (and vulnerability to food insecurity) (Figure 1):

Figure 1: Food and Nutrition Security Conceptual Framework



Food security is an outcome of the **livelihood strategies** adopted by a household, including but not limited to its income-generating activities. The livelihood strategies are based upon the **assets** or capital available to the household. This encompasses its human, social, natural, physical, and financial resources. A livelihood strategy is **sustainable** when '*It can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base'.*[1]The definition of sustainability helps introduce the concept of **vulnerability** (to food insecurity) in that this is influenced by the exposure to risk and the capacity to respond to stresses. **Vulnerability** is defined as *'The probability of an acute decline in food access, or consumption, often in reference to some critical value that defines minimum levels of human well-being*'. It is a function of the following:

1. **Hazard**, which is the potential to cause harm and can be defined as the probability of occurrence of a potentially damaging phenomenon within a given time period and area[2];

2. **Exposure to risk**, which is the probability of an event that, if it did materialize, would cause a welfare loss (e.g. drought); and

3. **Risk management**, which is the ability to mitigate the possible consequences of a probable event. This can in turn be divided into ex-ante risk management (**preparedness**) and ex-post risk management (**ability to cope**). The latter is the response after an event occurred. However, responses can be negative and unsustainable when they affect the resource base of the household (e.g. the selling

[1] DFID (1999) *Sustainable Livelihoods Guidance Sheet*, Department for International Development.
[2] United Nations University — Institute for Environment and Human Security (UNU-EHS).

of assets). The ability to cope is undermined by the intensity of the event itself but also by poor structural and societal conditions such as poverty.

In the context of this CFSVA, the Food and Nutrition Security Conceptual Framework presented in Figure 1 informs the selection of the analyzed indicators and their use in targeting as well as on the design of the survey instruments.

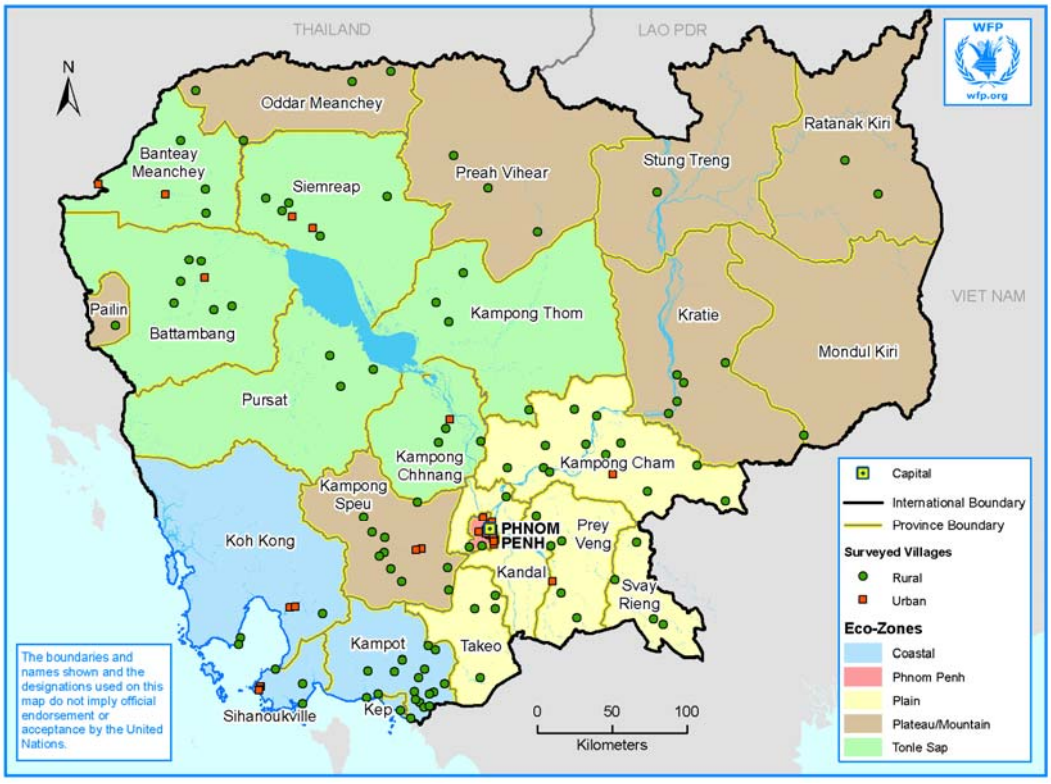
1.3 Methods

This report presents the results of the nation-wide food security assessment (CFSVA) that was implemented in Cambodia in 2008. The CFSVA methodology included primary data collection as well as review of secondary data. The primary data collection consists of the following: (i) a household survey administered to randomly selected households and (ii) a village checklist survey administered to key informants.

1.3.1 Sampling Procedure

The 2008 CFSVA was designed to provide statistically representative information for urban and rural areas at the national level and for the five ecological zones (Plains, Tonle Sap, Coastal, Plateau/Mountain and Phnom Penh) (Map 1). The survey applied a two-stage cluster sampling procedure. The villages (a total of 149 urban and rural villages) were the clusters. In the first stage and for each reporting zone (the five ecological zones and the urban and rural strata), villages were randomly selected by using a probability proportional to size (PPS) sampling technique, which implies that larger villages have higher probability to be selected for the survey than smaller villages. In the second stage, 15 households *per* village were randomly selected, for a total of 2,235 interviewed households (Annex A).

Map 1: CFSVA data collection and distribution of surveyed villages by ecological zone



Source: WFP

1.3.2 Data Sources

Secondary Data

The secondary data analysis was based on existing documents, reports, studies, policy papers, and data on food security, poverty, consumer price and hazards. The information was derived from various sources such as the Government, donors, UN agencies and NGOs.

Primary data: the Household Survey

The household questionnaire (HHQ) utilized for the household survey was designed and finalized through the active participation of several stakeholders. Primary data on food security was collected from 2,235 households during June 2008. The Cambodia Development Resource Institute (CDRI), under the supervision of the World Food Programme (WFP), was responsible for conducting the survey. Specifically, a total of 15 teams – each composed of three enumerators and one team leader – conducted the fieldwork. The teams participated in a 3-day training course prior to data collection, including the pilot testing of the survey questionnaire. The HH questionnaire is comprised of 10 sections: (1) Household composition, enrolment at school and housing; (2) Livestock; (3) Income sources, kinship support and assets; (4) Expenditure and debts; (5) Food consumption; (6) Food and crop stock; (7) Coping strategies and assistance; (8) Agricultural land of households; (9) Cropping on leased land; and (10) Crop sales and purchases.

Village Check List

The survey gathered information from 149 villages using a village checklist (VCL). This information provided a useful context to the data collected through the HHQ.

The VCL contained both pre-coded and open-ended questions and additional space for interviewers to provide comments and narratives in support of the interpretation of gathered data. The VCL included 7 sections: (1) General information including an estimation of landless; (2) Accessibility to the market including constraints; (3) Recent price and wage trends and identification of their seasonality; (4) Labor opportunities and intensity of seasonal migration cycles; (5) Food security indicators (levels of self-sufficiency, coping mechanisms, access to wild food); (6) Agricultural main patterns, including detailed crop calendars, cropping system changes, factor limiting crop performances; and (7) Drop-out patterns.

In each team of enumerators, the team leader was responsible for collecting the information from the village chief and other key informants.

1.3.3 Statistical Analysis Tools

The National Institute of Statistics (NIS) and WFP were responsible for the data entry of the household questionnaires and village checklists, respectively. Data was entered using the CSPro software and then converted into SPSS format.

Data cleaning and analysis was done through Excel and SPSS software. The analysis calculated and applied household weights. These are meant to compensate for the unequal probabilities of households to be included in the sample. Mapping was done through the ArcGIS 9.2 Geographical Information System (GIS) software.

1.3.4 Survey Limitations

Notwithstanding the overall soundness of CFSVA methods and findings, some limitations need to be noted:

- **Survey Period**
  A bias in the gathered data might be related to the survey period. One of the main objectives of the CFSVA was to analyze the impact of rise of staple food (rice) prices in the country. Primary data collection was, however, conducted during the first two weeks of June 2008 (Annex C1), which correspond to the incoming monsoon period. This implies that the corresponding data might be affected by a 'usual' seasonality component as well as by 'anomalies' linked to the exceptional food price rise. Disentangling the respective roles of these components proved to be particularly difficult during the analysis.

- **Ecological zone aggregation**
  The survey was conceived to aggregate and report village results according to the official ecological zones. However, the WFP team that travelled intensively during the survey confirmed what was already noted by previous observations: the ecological zoning, as officially defined, hid a very high internal variability (in term of food availability, consumption and livelihoods), often higher than the inter-zonal variability. For example, districts located in bordering ecological zones were more similar to the contiguous zone than to the one they were officially assigned. The information reported at ecological zone level might consequently be biased.

- **Cropping systems**
  The agricultural component of the household survey primarily focused on rice (wet and dry season), maize and cassava cultivations, whereas the importance of other economic crops, such as vegetables and permanent crops, was relatively understudied.

Other limitations might be related to the relatively short duration of the enumerator training (three days) prior to primary data collection and to the difficulties encountered in selecting replacement households during the survey.

1.4 Structure of the Report

The logic of the Food and Nutrition Security Conceptual Framework (Figure 1) guides the structure of this report. After some background information on Cambodia, the human, social, natural, physical and financial components are introduced. Livelihood strategies are then explored and livelihood outcomes are investigated with a focus on food security outcomes (food consumption). The analysis further deals with the general vulnerability context, such as exposure to shocks and coping strategies. The diverse components are analyzed to identify the main determinants of food insecurity in Cambodia. The determinants are then summarized in food security and vulnerability profiles to answer the main questions of food insecurity (e.g. who, how many, where, why). Finally, recommendations are made for WFP and its partners to strengthen food security programmes. Annexes at the end of the report show technical instruments (e.g. sampling details, survey tools) applied for the survey.

The discussion is disaggregated by urban and rural, and by ecological zones. The Cambodian Development Resource Institute (CDRI) has carried out mixed methods research (e.g. research which combines qualitative and quantitative analysis) for village and household-

level wealth and poverty analysis. As part of the research method, CDRI followed five reporting ecological zones: the capital Phnom Penh, the Coastal, Plains, Plateau/Mountain, and Tonle Sap regions. The Coastal zone is characterized by a prevailing wet-season grown rice and higher prevalence of wage labor; the Plains zone has a predominant dry-season rice and substantial fisheries; the Plateau/Mountain zone includes provinces with dry and wet rice and significant proportion of the land covered with forests. Wage labor opportunities are an important part of local livelihoods in this region. Finally, the Tonle Sap zone is characterized by wet season rice and high numbers of resettled returnees and migrants. Fishing is an important component of livelihoods in some of the provinces of this region.

Unless otherwise indicated, results presented in the charts and tables throughout the report are based on information gathered from surveyed households or village key informants.

2. Background Information on Cambodia

Outline of the Chapter

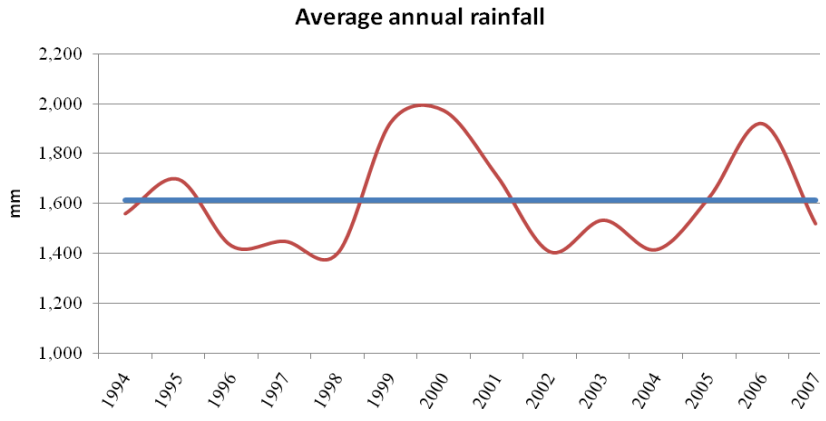
This chapter provides useful background information to set the context of this report and to guide the reading of results from the CFSVA 2008 survey. The chapter offers an overview of the environmental, political and institutional contexts in Cambodia. In addition, it sets the scene for poverty and food security conditions in the country and highlights the main policies and interventions aiming to alleviate food insecurity and vulnerability. Food security in Cambodia is intimately linked to the production and economy of rice, the main staple food of the Cambodian people. A discussion on the increase in rice prices in 2008 will describe the special context in which the CFSVA survey was conducted.

2.1 Geography and Climate

Cambodia has an area of 181,035 square kilometers. It borders Thailand to the north and west, Laos to the northeast, and Vietnam to the east and southeast. Cambodia has a 443-kilometer coastline along the Gulf of Thailand and low-elevated mountains spanning along the coast. The Dangrek Mountain Range forms the frontier with Thailand in the northwest, while the Cardamom Mountains and the Elephant Mountain Range spread across the west. The alluvial plains that extend in the central part of the country are the most distinctive geographical feature of Cambodia. These lacustrine plains were formed by the inundations of the Tonle Sap (Great Lake) and are drained by the Mekong River. The principal inland water bodies are the Mekong River, the Tonle Sap (Great Lake) and the Tonle-Bassac River. Together they form a network of river channels, levees and river basins that stretches across the entire lowlands.

Temperatures range from 21 to 35 degree Celsius. The wet and dry monsoons mark two distinct seasons and primarily determine Cambodia's climate. Southwest monsoons blow inland bringing moisture-laden winds from May to October. The northeast monsoon ushers in the dry season, which lasts from November to March. The country experiences the heaviest precipitation from September to October with the driest period occurring from January to February. Cambodia is affected by high rainfall variability, both inter-annual and interregional. For instance, Chart 1 below illustrates that during the period 1994 to 2007, the rainfall pattern comprised both dry periods (1996-98 and 2002-04) and two peaks of rainfall (1999-2000 and 2006) with values different from the yearly average (1,600 mm).

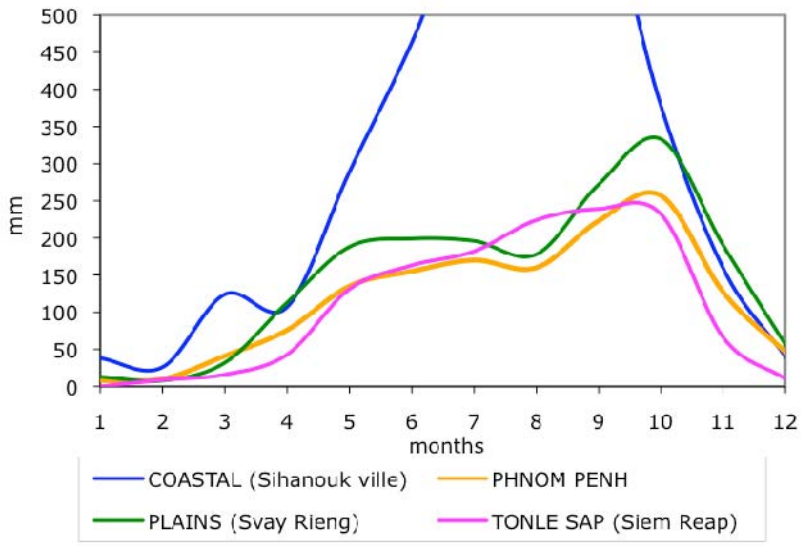
Chart 1: Average annual rainfall



Source: National Institute of Statistics/Ministry of Water Resources and Meteorology

National annual figures of rainfall also mask significant inter-regional differences: the coastal regions receive the highest rainfall (about 3,000 mm/year), while the highlands and lowlands receive 2,500 mm/year and 1,400 mm/year, respectively [3]. Chart 2 below highlights these inter-regional differences, using historical averages from a few meteorological stations as provided by the FAOCLIM2 database. Clear differences can be observed between the rainfall values of the meteorological station in the Coastal zone and monthly values in the other meteorological stations.

Chart 2: Monthly average rainfall



Source: FAOCLIM2 database. Historical average of monthly rainfall values

2.1.1 Water Resources

Cambodia has considerable water resources. The main water bodies of Cambodia are the Tonle Sap (Great Lake) that lies in the heartland of the country and the Mekong River that runs northeast to south across the country. Tonle Sap Lake encompasses an area of 250,000-300,000 hectares in the dry season and is estimated to have a capacity of 72,000 m^3. The Mekong River flows across the country for approximately 485 km, providing an annual flow of 500 billion cubic meters. The provinces of Kampong Thom, Siem Reap, Banteay Meanchey, Battambang, Pursat and Kampong Chhnang are the major beneficiaries of Tonle Sap Lake. Phnom Penh, being the point of convergence of the Mekong and Bassac Rivers, possesses considerable surface water resources. The province of Kandal has approximately 17 percent of its area occupied by water bodies. However, fewer water bodies are found in the eastern provinces of Mondul Kiri and Ratanak Kiri, Oddar Meanchey and Preah Vihear in the north, as well as in the coastal provinces of Sihanoukville and Kep[4]. Pressure on water resources is increasing to meet the demands for cultivation and irrigation, industry, aquaculture and domestic purposes[5].

[3] According to aggregated figures provided by NIS/MOWRAM.
[4] World Food Programme (2005), Food Security Atlas of Cambodia, p.48.
[5] ibid.

2.2 Historical and Political Context

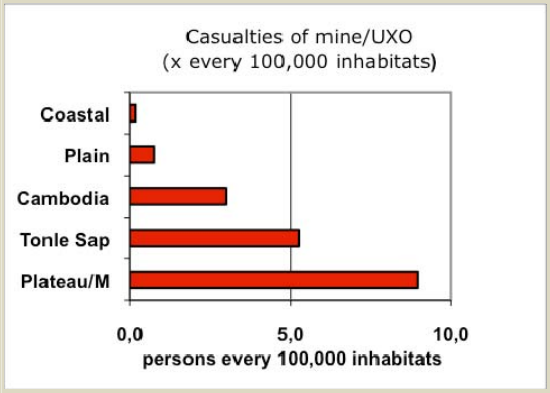
Cambodia experienced decades of conflict from the 1970s to the 1990s. The Khmer Rouge period from 1975-1979 devastated the country, leading to up to 1.7 million deaths. The Paris Conference of 1991 and UN Transitional Authority in Cambodia (UNTAC) beginning in 1992 helped to stabilize the country. In 1993, with the promulgation of a new constitution, Cambodia became a multi-party democracy with separate executive, legislative and judicial branches of government. Decentralization has moved forward, devolving increasing levels of resources and decision-making powers to provincial and commune-level authorities. Public administration and regulatory reforms have been undertaken. Cambodia has made notable progress since the early 1990s, for instance with the recent passage of laws regulating economic concessions, investment, and commercial enterprises. Some of the key accomplishments include the following: national elections in 1993 and regularly thereafter; return of all feuding factions to a democratic framework with the dissolution of the Khmer Rouge in 1998; Commune Council elections in 2002 and 2007; an open market and fast-growing economy that has attracted foreign investments since 1993; an expanding tourism industry; and a thriving civil society. Cambodia is now a full member of ASEAN and WTO.

Notwithstanding this progress, Cambodia still faces many challenges, as it remains an aid-dependent Least Developed Country (LDC), with more than a third of its population below the poverty line[6]. Poverty is particularly concentrated in the rural areas of Cambodia, as indicated by the World Bank poverty assessment of 2006. The lack of secure land tenure, remoteness from markets and services, lack of productive assets, low levels of education, and high dependency ratios are all factors contributing to the poor living conditions of the rural population of Cambodia[7].

Box 1 – Mines and unexploded ordnance (UXO)

UNICEF has designated Cambodia the third most landmined country in the world, attributing over 60,000 civilian deaths and thousands more maimed or injured since 1970 to the unexploded land mines left behind in rural areas. The majority of victims are children herding animals or playing in the fields[8].

Mine/UXO casualties are still very high in Cambodia, concentrated mainly in the Tonle Sap (almost half) and Plateau/Mountain zones (almost a third). These zones still see high mortality and morbidity due to mines and UXO. Mortality is high in the Plateau/Mountain (nine persons per 100,000) and Tonle Sap zones (5.3 persons every 100,000).



Source: Cambodia Mine/UXO Victim Information System 2006

[6] Ministry of Planning (2006), A Poverty Profile of Cambodia 2004, p. 24.
[7] World Bank, 2006, Cambodia: Halving Poverty by 2015? p. ii & v.
[8] UNICEF – 'The Legacy of Landmines'. http://www.unicef.org/sowc96/9ldmines.htm.

2.3 Demographics

The 2008 census data reports that the human population was 13,388,910. The Human Development Index (HDI) ranked Cambodia 137th out of 182 countries with data, in 2007[9]. Administratively, the country is divided in 23 provinces and the capital, Phnom Penh. The civil war and its aftermath have had a marked effect on the structure of Cambodian population. 50 percent of the population is younger than 22. At 0.96 males to females, Cambodia has the most female-biased sex ratio in the Greater Mekong Sub-region. In the Cambodian population over 65, the female to male ratio is 1.6:1 (CIA World Factbook). The main religion is a form of Theravada Buddhism (95 percent of the population). Islam (three percent) and Christianity (two percent) are also practiced.

2.4 Poverty Reduction and Food Security Interventions

2.4.1 Main Policies for Food Security

The Royal Government of Cambodia (RGC) has made considerable effort toward the development and implementation of programmes for poverty reduction and alleviation of the food insecurity. The National Strategic Development Plan (NSDP) (2006-2010) has as a main objective the achievement of poverty reduction targets in the Millennium Development Goals (MDG). Rural development and improvement of the livelihood of the rural poor have been recognized as top priorities of the NSDP 2006-2010. In particular, social protection is one of its key commitments, including creating jobs in the formal and informal sectors and ensuring improved working conditions; providing social safety nets for the disadvantaged; measures to assist victims of natural disasters; targeted programmes for vulnerable groups such as poor female-headed households and veterans, and establishment of rehabilitation centers for orphans and the elderly; addressing domestic violence and trafficking; and improving health service delivery, quality, and financing. The NSDP is therefore a single and overarching document containing the RGC priority goals and strategies to reduce poverty rapidly and to achieve its CMDGs[10]. In addition, the NSDP explicitly recognizes the need for further progress in food security and nutrition as a key action to meet the NSDP priorities.

The Council for Agricultural and Rural Development (CARD) of RGC, in consultation with the technical working group on food security and nutrition (TWG-FSN), developed, in 2007, the Strategic Framework for Food Security and Nutrition (SFFSN) for 2008-2012. The SFFSN is expected to provide substantial progress toward improved food security and nutrition conditions in Cambodia. Based on this strategy, by 2020, the poor and food insecure Cambodians should have substantially improved their physical and economic access and are expected to have sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life[11].

2.4.2 National and International Food Aid Programmes

Cambodia has been receiving food aid, predominantly rice, for more than two decades. In the 1980s, Cambodia received over 120,000 Mt of food aid per year to support refugee operations on the Thai border. However, the country has reduced its food aid dependence as food aid shipments to Cambodia have consistently ranged from 30,000 Mt to 50,000 Mt for the past ten years. Food aid from donors accounts for a relatively small share in total food

[9] From http://hdrstats.undp.org/en/countries/country_fact_sheets/cty_fs_KHM.html.
[10] Royal Government of Cambodia, 2005, National Strategic Development Plan 2006-2010, p.vii.
[11] CARD, 2008, Strategic Framework for Food Security and Nutrition in Cambodia 2008-2012, p.7.

available at national level. The share of food aid in the overall food consumption declined from 2.3 percent in 1990-1992 to 1.4 percent in 2001-2003[12].

2.5 Aggregate Food Availability and Markets

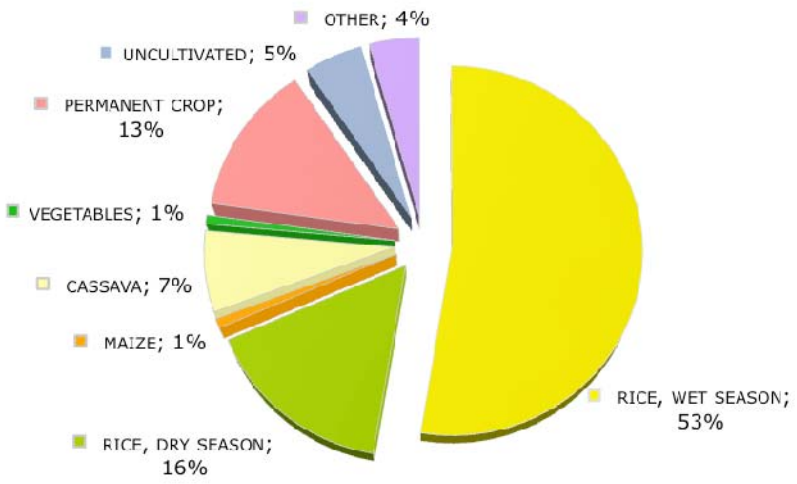
2.5.1 Rice

Cambodia is a predominantly agrarian society with approximately 84 percent of its households living in rural areas. Nearly 82 percent of them have some link with agricultural production, either as landowners (79 percent) or leaseholders (21 percent), and primarily rely on agricultural production to support their livelihoods. Rice is the most important agricultural commodity in Cambodia and the staple food of the Cambodian people.

Rice Cropping Systems

Chart 3 illustrates that, in 1997[13], rice cropping occupied the largest part of the farmed land in Cambodia. In 2006, rice production comprised 84 percent of total cultivated land[14] and FAO statistics[15] report that, in 2007, the area harvested with paddy rice accounted for 2,566,000 ha.

Chart 3: Use of agricultural land in Cambodia

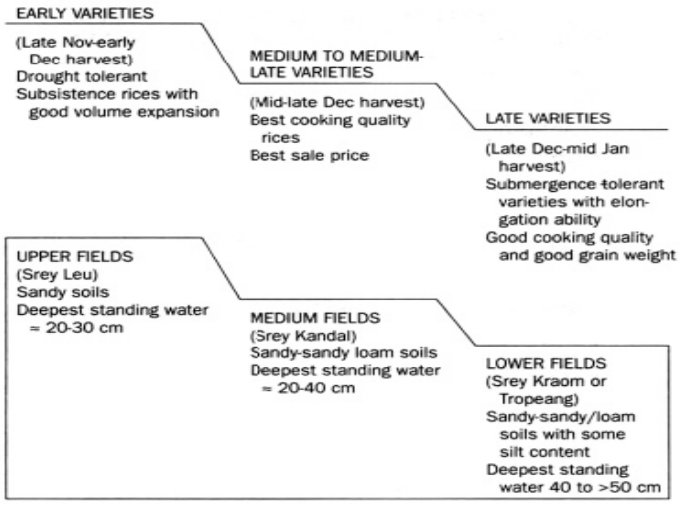


The diverse topographical aspects of the farmed land (lowlands as opposed to upper lands) and the wide range of rice varieties concur to compose diverse cropping systems. Rice-based cropping systems typically dominate the lowlands and plains. They mainly concentrate around Tonle Sap Lake and in the southeastern part of the country. In other regions, rice is integrated in several types of multiple-cropping systems in the hills and slopes and often in conjunction with grazing land. Rice yields in uplands are usually lower than for lowland rice. Intercropping and rotation are frequent and the role of tree crops has been gaining greater relevance in recent times for these cropping systems.

[12] WFP (2007), Integrated Food Security and Humanitarian Phase Classification (IPC), p.22.
[13] Most of the information is extracted from 'Rice Production in Cambodia', edited by H J Nesbitt, Cambodia-IRRI-Australia Project, 1997.
[14] Agrifood Consulting International and CamConsult report prepared for AusAID, 2006.
[15] FAOSTAT, online database http://faostat.fao.org.

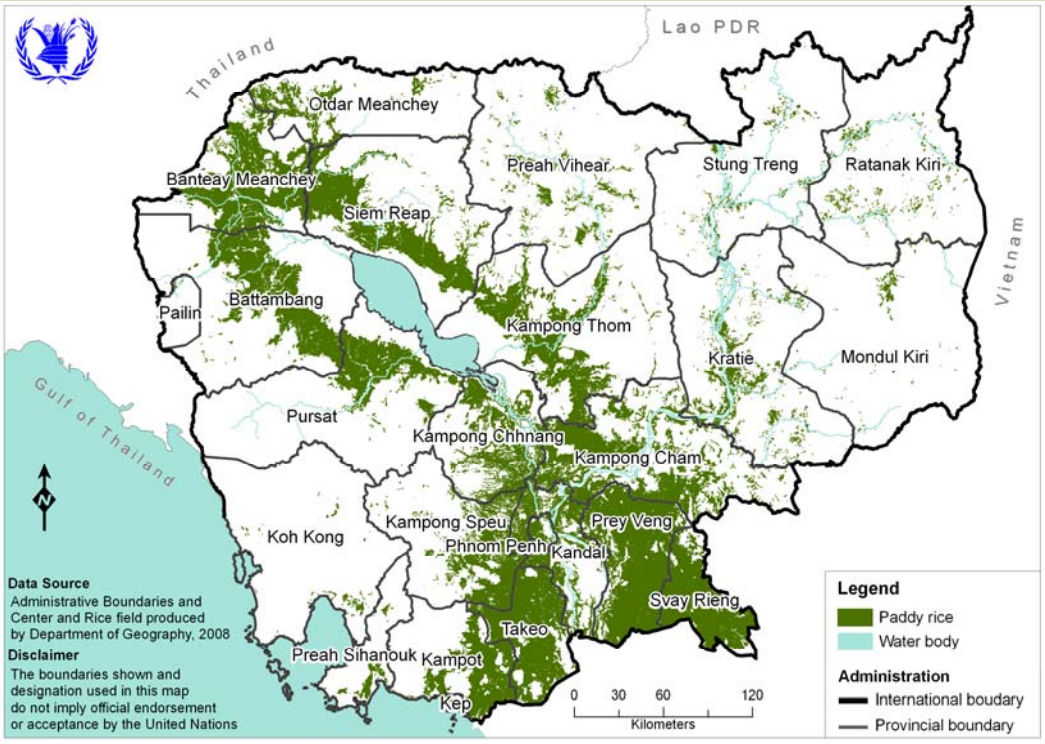
Wet-season rain-fed rice varieties can be broadly classified according to maturity-criteria (Figure 2) (early=*srau sral;* medium=*srau kandal*; and late=*srau thungun*). Early varieties flower before mid-October, medium between mid-October and mid-November, and late varieties flower after mid-November. These different types are well adapted to the diverse rainfall conditions in Cambodia. Overall, lowland fields are flood-prone, while higher fields are drought-prone. Figure 2 summarizes the rice varieties (and their maturity time), best suited to diverse topographical situations. Map 2 shows the spatial distribution of paddy rice.

Figure 2: Rice varieties in Cambodia



Source: Rice Production in Cambodia, edited by H J Nesbitt, Cambodia-IRRI-Australia Project, 1997

Map 2: Spatial distribution of paddy rice fields



Source: Rice Production in Cambodia, edited by H J Nesbitt, Cambodia-IRRI-Australia Project, 1997.

RICE PRODUCTION, IMPORT, AND EXPORT

Estimates made by the Ministry of Agriculture, Forestry and Fisheries (MAFF), indicate that Cambodia has produced a national surplus of rice since 1995/96. For the period 2007/2008, the rice surplus was estimated to be approximately 1.65 million Mt of milled rice after adjusting for per capita food requirement of 143 kg per year (Chart 4).

Chart 4: Rice production and surplus

Note: Figures of rice production and surplus are both expressed as Mt of milled rice using the official coefficient (0.64 - i.e. 1 Mt of paddy rice = 0.64 Mt of milled).

Source: Ministry of Agriculture, Forestry and Fisheries, 2008

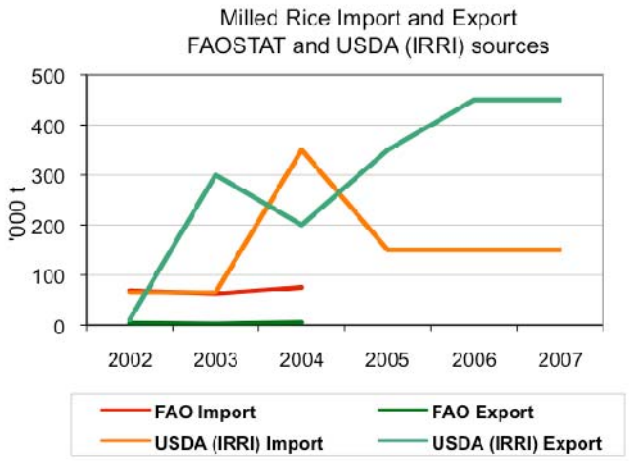
Although there is no conclusive evidence on the self-sufficiency of Cambodia in rice production the United States Department of Agriculture (USDA) and the International Rice Research Institute (IRRI) agree with the official estimates. These sources indicate that Cambodia has been - since 2003 - a milled rice net exporter (with the exclusion of 2004).

However, FAOSTAT data indicates that Cambodia has been a net importer since the mid 1990s and up to 2005 (last available year)[16] (Chart 5). These contrasting indications might be the result of both unreported import and export figures. Import figures could be misreported given the cross-border trade between surplus rice-producing areas, such as Battambang and Thailand. Here, rice paddy is exported – often unofficially – to and milled on the Thai side of the border before being imported back into Cambodia[17]. At the same time, export figures might be underestimated due to unregistered exports of rice.

[16] The 2007 WFP 'Integrated Food Security and Humanitarian Phase Classification (IPC)' document already expressed some doubts about the Export figures: *'export figures seem to be underestimated due to rice unregistered exports'* (see page 21).

[17] WFP (2007), Integrated Food Security and Humanitarian Phase Classification (IPC), p.21.

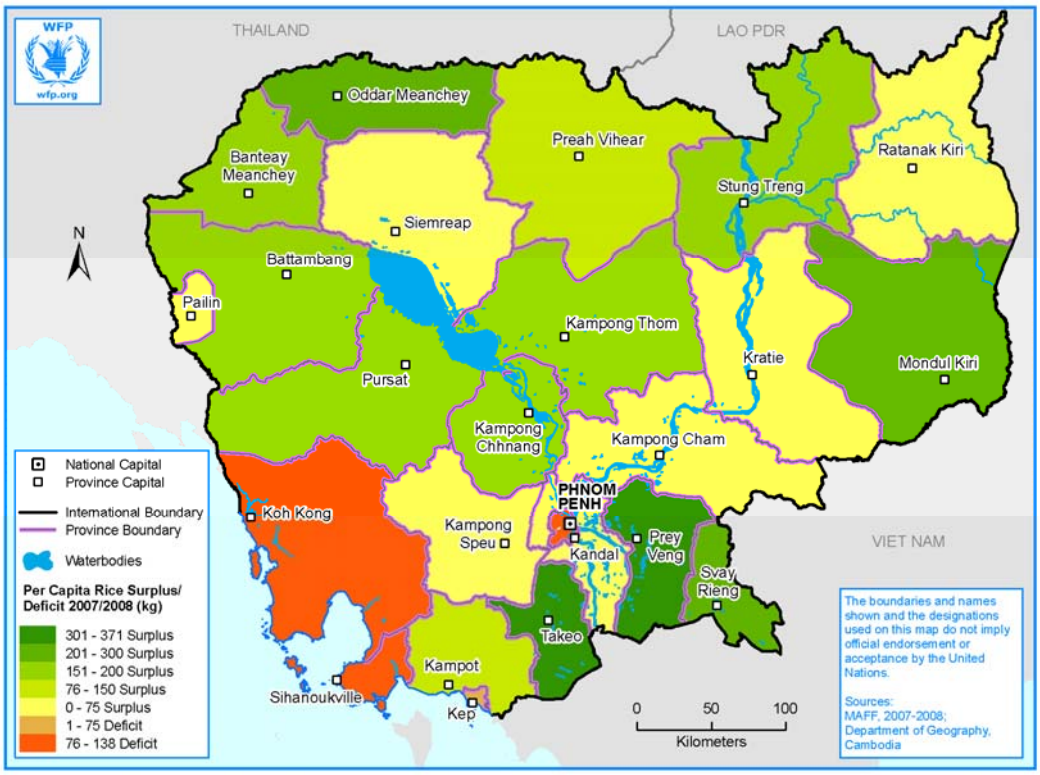
Chart 5: Import and export of milled rice



Sources: FAOSTAT and USDA (IRRI)

Disaggregated data at the province level (Map 3) shows that Koh Kong, Sihanouk Ville, Kep and Phnom Penh are the only provinces with rice deficits whereas all remaining provinces have rice surpluses. There is, however, insufficient data to further disaggregate the figures and capture a more detailed picture.

Map 3: Per capita rice surplus/deficit 2007-2008 (kg) by province

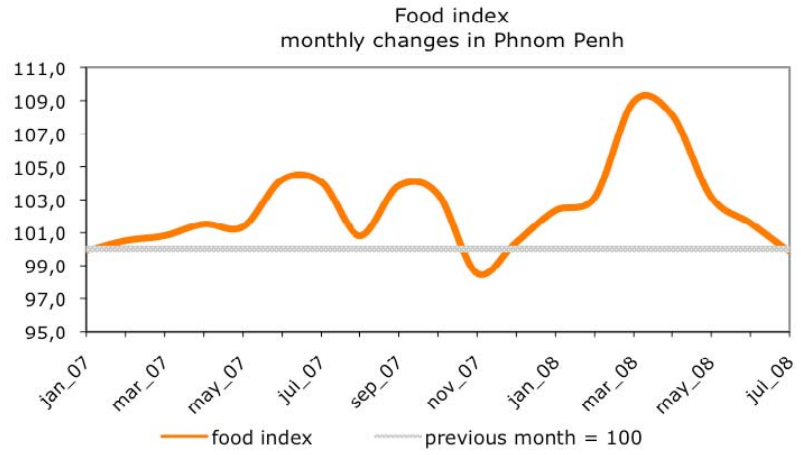


Source: Ministry of Agriculture, Forestry and Fisheries, 2007/2008

RICE: MARKET PRICES AND PRICE TRENDS

In a normal year, rice prices would generally increase during April-May and during the lean season (August-November), and decrease from December to March (harvest and post-harvest seasons). Chart 6 shows the food index fluctuations in Phnom Penh during 2007 and 2008. Monthly variations are expressed as changes compared to previous month.

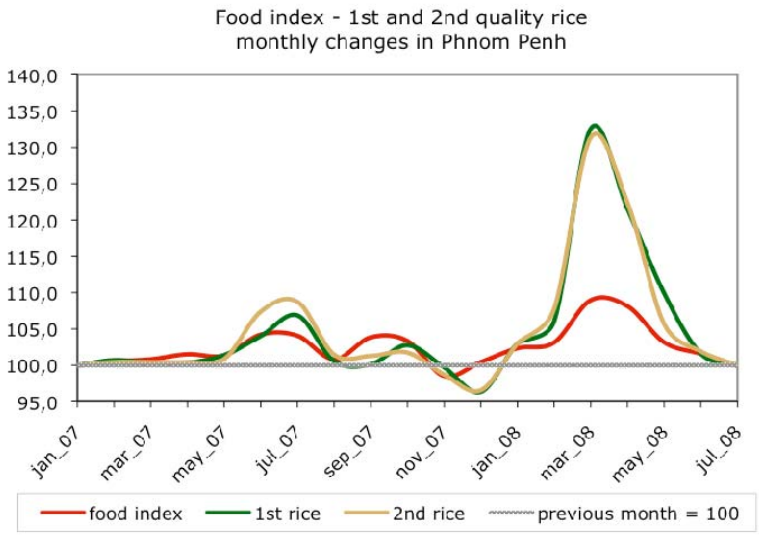
Chart 6: Monthly fluctuations in the Food Index, Phnom Penh



Source: National Institute of Statistics

In early 2008, Cambodia, like many countries worldwide, experienced rising prices of essential goods, mainly food and fuel. However, a closer look reveals that the upward trend of food prices was already registered in Cambodia between 2002 and 2005, as indicated by the 2007 IPC report (WFP, 2007). Chart 7 shows that food prices peaked between March and May 2008 but over the following months the increase declined markedly. The peak at the end of April 2008 was primarily due to the huge increase in rice prices. Chart 7 also compares the rice price indices with the overall food prices index. It shows that even in 2007, the prices indices were overall smaller than those of the first and second qualities of rice (used as main reference). The above gap became dramatic during spring 2008.

Chart 7: Food Index, first and second quality rice, Phnom Penh

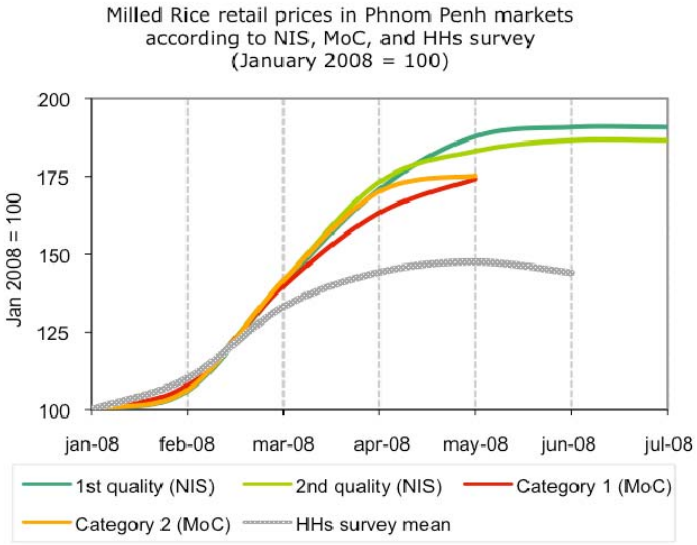


Source: National Institute of Statistics

The sharp rise in rice prices compelled the Government of Cambodia to impose an export ban between March and May 2008 as a counter measure to control prices for domestic consumers. The ban was subsequently removed when the dry-season harvest arrived.

The MoC and NIS are the two principal sources of information on milled rice retail prices and rates of price increase during 2008. Despite the limited comparability of results from these sources due to diverse data collection methods (Chart 8), both agree on the increase of milled rice retail prices between March and May 2008. When the CFSVA household survey was planned (data collection in the first half of June 2008), there was still a fear that the increasing food prices could result in widespread food insecurity as the lean period was approaching. Fortunately, as indicated earlier in the text, a slower growth rate was already evident during May 2008. The NIS data, referring to June and July 2008 confirms this: rice prices remained high but stable up to November (Chart 8, left graph). Interestingly, the results from the CFSVA survey indicate similar price trends (see grey curve in Chart 8). Survey results, which will be discussed later in this report, likely show a lower increase because the survey information gathered prices for the diverse rice qualities without distinction whereas the chart below focuses on the prices of the first and second quality of milled rice only.

Chart 8: Milled rice retailed prices in Phnom Penh according to diverse sources and survey results



SUMMARY OF CHAPTER 2

Despite the considerable progress made by Cambodia in recent years, food insecurity remains a main concern for the country. National figures probably mask a high variability of conditions within the country. The findings from the 2008 CFSVA survey presented in the following chapters help us better understand who the food insecure are, where they are, and what the main determinants for the food insecurity and vulnerability are. These findings are expected to guide interventions to alleviate these conditions.

RESULTS OF THE 2008 CFSVA OF CAMBODIA

3. ASSETS ENDOWMENTS

OUTLINE OF THE CHAPTER

Households strive to secure sustainable, sufficient and adequate income and resources to meet their basic needs and to achieve livelihood security. Physical and social accessibility to different types of assets contribute to the viability of livelihoods and to households' capacities to respond and cope in times of crisis. This chapter analyzes various household assets. Information on households' access to and availability of assets and capital enhances our understanding of the main dimensions of the food security: food availability (e.g. rice production), food access (e.g. market outlets, food expenditures), and food utilization (e.g. access to health services). In consideration of the fact that a primary objective of the CFSVA was to identify the impact of the rise of food prices in 2008, a detailed discussion of the economic and financial capital and the analysis of the income activities that compose the livelihood strategies are discussed in more detail in Chapter 4.

3.1 NATURAL CAPITAL

3.1.1 AGRICULTURAL PRODUCTION

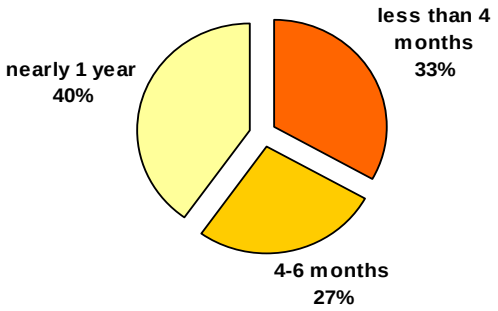
The HHQ survey and the VCL of the 2008 CFSVA of Cambodia complemented the national figures, providing a significant contribution to the understanding of the interregional differences, potentials, and constraints of the farming sector. In particular, the HHQ focused on the farm financial balance sheet and the financial constraints for agricultural development, whereas the VCL tried to get an overview of crop practices, environmental and human factors limiting crop performances, as well as a picture of rural production practices (e.g. new crops, abandoned crops, involved actors). Together they provide useful information on food availability and food access in the context of agricultural production.

FOOD SELF-SUFFICIENCY AND DEFICIT AREAS

The VCL gathered qualitative estimates on the level of household self-sufficiency in each surveyed village. Key informants were asked to estimate the percentage of households in the village that were self-sufficient for less than four months, between four and six months, and for nearly one year. The underlying assumption is that those households that are self-sufficient for less than four months are more exposed to price fluctuations since they depend more on the market. Likewise, it is hypothesized that those households that are self-sufficient for nearly one year are relatively less exposed to price increases.

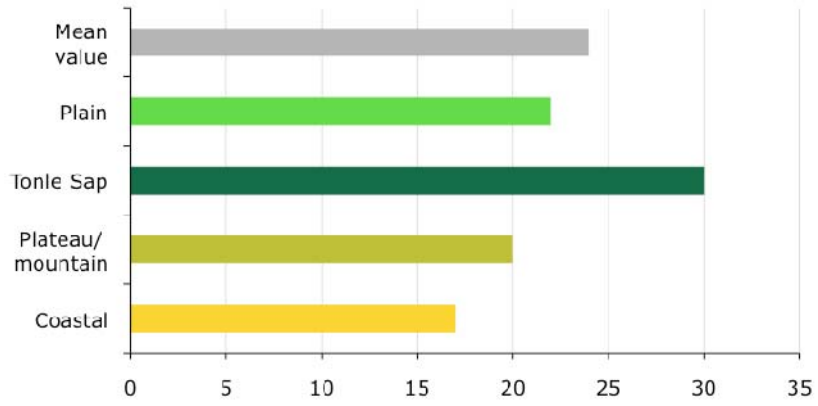
One-third of households surveyed were self-sufficient for less than four months, and little variability was found across ecological zones. However, there were significant differences across ecological zones for the percentage of households that are self-sufficient for nearly one year: In the Coastal and Plateau/Mountain zones this figure was 30 percent, while it was 43 percent for the Plains and Tonle Sap zones. Chart 9 below illustrates the national average figures for the surveyed villages.

Chart 9: Food self-sufficiency as gathered from VCL



Key informants were also requested to provide information about the proportion of households in the village that are able to save part of their crop for the next year (Chart 10). The chart indicates significant variability across ecological zones (the capital Phnom Penh was excluded). At the national level, 1 out of 4 households was able to save part of the crop production. However, in the Coastal zone, only 17 percent of the households reported being able to save part of this year's crop production for next year. The highest proportion was found in the Tonle Sap zone, where 30 percent of households could save part of their crop production for the following year.

Chart 10: Percentage of households who can save part of their crop for the next year by ecological zone



WET RICE PRODUCTION

The analysis also provided an estimation of the proportion of households with a marketable surplus of wet rice production. This implies deducting the own consumption of the households from the reported production and assuming that the remaining is a tradable surplus. The annual per capita consumption of rice was hence estimated at 150 kg per person per year of milled rice, based on World Bank data[18]. The median amount of surplus (in kg) and percentage of farms was then reported by ecological zone. Table

[18] See Cambodia halving poverty by 2015? World Bank page 85, footnote 11.

1 below shows that the highest percentage of farming households with a surplus of wet rice production was located in the Tonle Sap and Plateau/Mountain zones. The highest rice production figures in the alluvial plains of the Tonle Sap zone likely explain the higher median surplus in the Tonle Sap zone (900 kg) than in the Plateau/Mountain zone (750 kg per farm). On the contrary, the Plains zone is significantly different from the Tonle Sap and Plateau zone, with only 32 percent of farms having a surplus.

Table 1: Farms with wet rice production surplus by ecological zone

	Surplus (wet paddy rice)	
	% Farms	Median (kg)
Phnom Penh	35%	390
Plains	**32%** *	750
Tonle Sap	60%	900
Plateau/Mountain	61%	750
Coastal	54%	595
Average value	46%	786

* Significantly different (p=0.05)

In the Tonle Sap zone, the information collected at the household level confirmed the information reported by key informants for the entire village. The Tonle Sap zone had a consistently higher proportion of households that could save part of their production for the following year and farms with a surplus production. However, the two sources of information disagree for the Plateau/Mountain Zone. This zone had the second lowest proportion of households able to save part of their production, but the highest percentage of villages reporting a surplus in wet rice production. The variability of conditions within a single village and the role of different crops other than rice might explain this difference.

Both wet and dry rice and all other crop production greatly benefit from irrigation. Currently, less than 20 percent of the cultivated land in Cambodia is irrigated and the large majority of fields rely only on rainfall. Land is typically irrigated through small canals or pumps, conveying water directly to fields. It is estimated that irrigated areas (19.5 percent) currently produce 31 percent of the total rice production of Cambodia. Important increases in yield may be expected with the development of irrigation systems.[19]

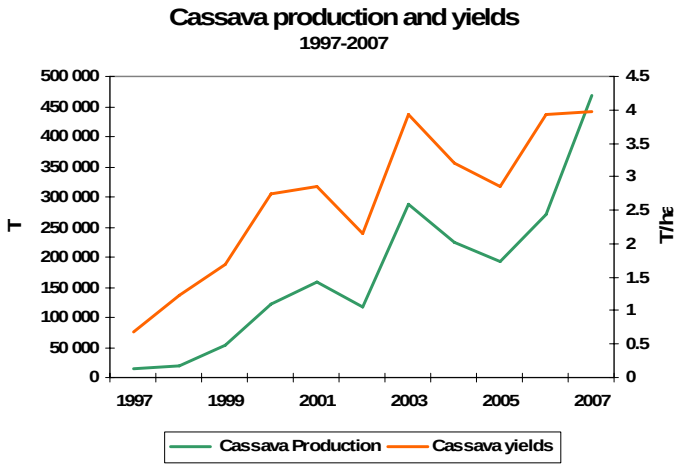
Other Crops

The past decade has seen an increasing importance of cassava and sweet potatoes in the cropping systems of Cambodia. While less appreciated by farmers, cassava is eaten mainly during food stress periods and has recently found a new role as a cash crop for export. Chart 11 illustrates this trend between 1997 and 2007, both in terms of national production and yields (Mt/ha). Information from the VCL confirmed these national figures and indicated an increasing diversification of the cropping systems in the country. Changes were reported in approximately 25 percent of the surveyed villages. In most cases, permanent crops such as rubber were lately introduced (26 and 24 percent of the cases, respectively)[20].

[19] Royal Government of Cambodia (2002), National Poverty Reduction Strategy 2003-2005, p.62

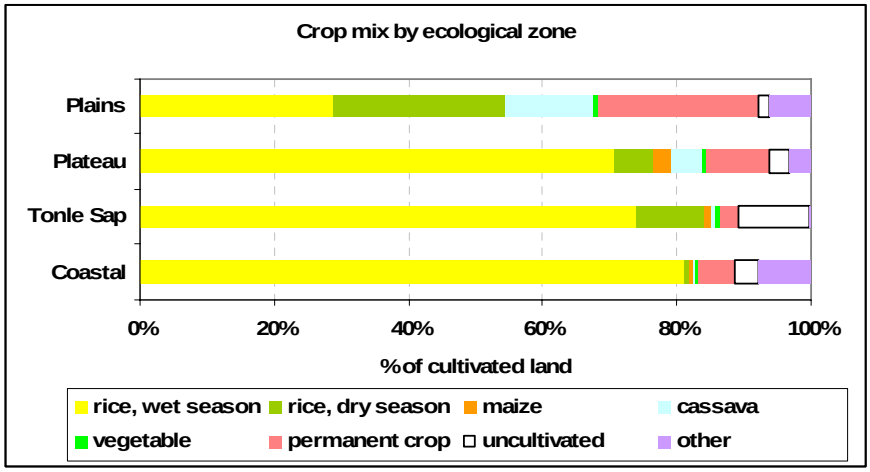
[20] On the contrary the most relevant abandoned crop was cashew nut (33 percent) followed by maize (10 percent).

Chart 11: Cassava production



The diverse crop combinations (percent of the cultivated land) reported by ecological zones in Chart 12 also illustrate the diversification in farming systems. The Plains zone, with approximately equal proportions of land occupied by wet and dry season rice, permanent crop and cassava, has the most diversified crop systems among the ecological zones.

Chart 12: Crop mix by ecological zone



Crop Practices

Table 2 below provides an overview of the diverse cropping practices in the five ecological zones. For each cropping practice, key informants were asked to estimate the proportion of households in the village that frequently[21] apply slash and burn, fallow, and intercropping practices and utilize organic and inorganic fertilizers. It is interesting to note that modern and traditional practices apparently coexist in the country. Overall, approximately 25 percent of the villages report frequent use of slash and burn practices

[21] Three categories of use where requested: 'frequently', 'seldom' and 'never'.

(which are typically related to subsistence forms of agriculture). At the same time, a large majority of villages also reported the use of inorganic fertilizers, which are usually associated with more developed cropping systems. The table also reveals important differences across ecological zones. The Plateau/Mountain zone has a significantly high prevalence of slash and burn practices, intercropping and organic fertilizers. This indicates that the region has diversified forms of farming systems and also points to the importance of the livestock sector in this area.

Table 2: Percentage of villages in each ecological zone where crop practices are frequently applied

	Slash & Burn	Fallow practice	Intercropping	Use of organic fertilizer	Use of inorganic fertilizer
Coastal	--	22%	22%	62%	62%
Phnom Penh	--	--	--	--	100%
Plain	14%	--	23%	44%	55%
Plateau/Mt	58%	--	47%	60%	12%
Tonle Sap	25%	3%	8%	43%	62%
Mean value	**24%**	**5%**	**20%**	**42%**	**58%**

3.1.2 Land Distribution And Land Tenure

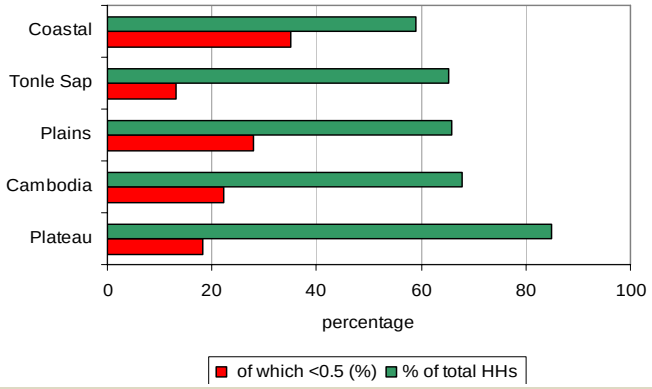
Land Distribution

Land is a key asset for poor people[22]. The importance of land is paramount in primarily agrarian societies, such as Cambodia, where most of the population makes a living as small-holding farmers, meeting the majority of their food and income needs directly from the land. With low levels of education and constrained access to capital, rural Cambodians have limited off-farm employment or self-employment opportunities. This is changing with economic growth and diversification, but land remains a critical resource for the poor, 91 percent of whom live in the countryside (World Bank, 2007)[23].

The HHQ survey has estimated that 67.8 percent of households living outside Phnom Penh have at least one agricultural plot[24]. This estimate includes the urban areas outside Phnom Penh ('other urban')[25]. The lowest percentage of households with land has been detected in the Coastal ecological zone (59 percent), likely because of higher population density; the highest percentage is in the less densely populated Plateau/Mountain zone (85 percent). The average dimension of farms, as estimated through the HHQ, is about 1.6 ha (a very close figure to the 1.5 ha value reported by the World Bank[26]) but nearly 50 percent of the landowning farmers own plots with dimensions smaller or equal to one ha (Chart 13).

[22] World Bank, 2006, World Development Report, Oxford University Press, p.162.
[23] World Bank, 2007, Cambodia: Sharing Growth : Equity and Development Report, p.56.
[24] When Phnom Penh is included in the computation the percentage decreases by about four percentage points.
[25] In Phnom Penh - not plotted in the Chart - there was a small percentage of households with agricultural land (only 14.5 percent). Most of them farm less than 0.5 ha.
[26] World Bank, 2006, Cambodia: Halving Poverty by 2015, p.84.

Chart 13: Percentage of households with land, and percentage of these households with land size less than 0.5 ha, by ecological zone



Farm size (ha)	% farm holdings
<0.5	22.1
0.5-1	24.5
1-3	26.3
3-5	21.7
5-10	3.9
>10	1.6

The average size of farm holdings disaggregated by ecological zone (Chart 14) shows that the Tonle Sap zone has the highest proportion of holdings larger than three ha (37 percent) and the lowest percentage of farm holdings smaller than 0.5 ha (13 percent). On the other hand, the Coastal zone had the highest proportion of small farm holdings (35 percent) and the lowest proportion of farms larger than three ha (16 percent). In other ecological zones the situation is more balanced, with a higher share of landholders with plots of 0.5 ha to three ha.

Chart 14: Farm holding size by ecological zone

The data suggests an unequal distribution of the farmed land in each of the five ecological zones, with only 10 percent of the farm holders owning approximately 45 percent of the farmed land. The World Bank Poverty Assessment 2006 reported that the proportion of rural households lacking land for cultivation has increased from 13 percent in 1997, to 16 percent in 1999, and to 20 percent in 2004.

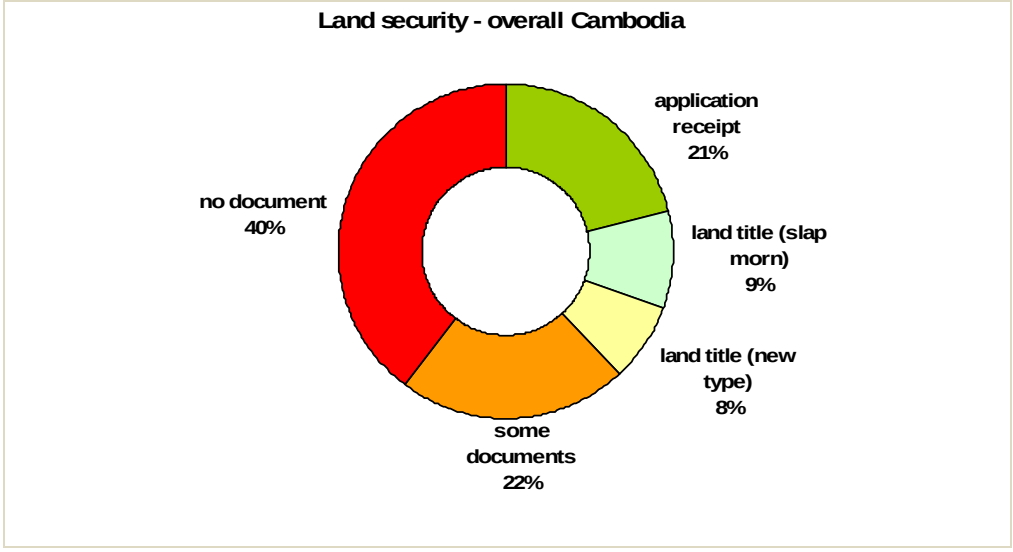
In addition, a growing number of households were reported to be 'near landless', owning only very small plots. This increasing proportion is linked to (i) those that returned from the refugee camps in 1993-94 that have never owned land and to (ii) population growth that typically leads to smaller plot sizes in densely populated areas.

Since the early 1990s, land in Cambodia began to acquire significant market value and there are households who choose to sell their land. Population growth and market integration have resulted in increasing competition for land, bringing the traditional concept of usufruct – e.g. someone who cleared land and cultivated it was assumed to own it – into conflict with commercial, state, and environmental interests and claims[27].

Land Tenure Arrangement

The survey data showed that 40 percent of surveyed farm holders lack any legal document for the land they cultivate (Chart 15). This might signal a critical situation since relevant literature suggests that the lack of official property titles is a main constraint for improving farming systems and for reaching higher productivity.

Chart 15: Ownership of land titles in Cambodia[28]



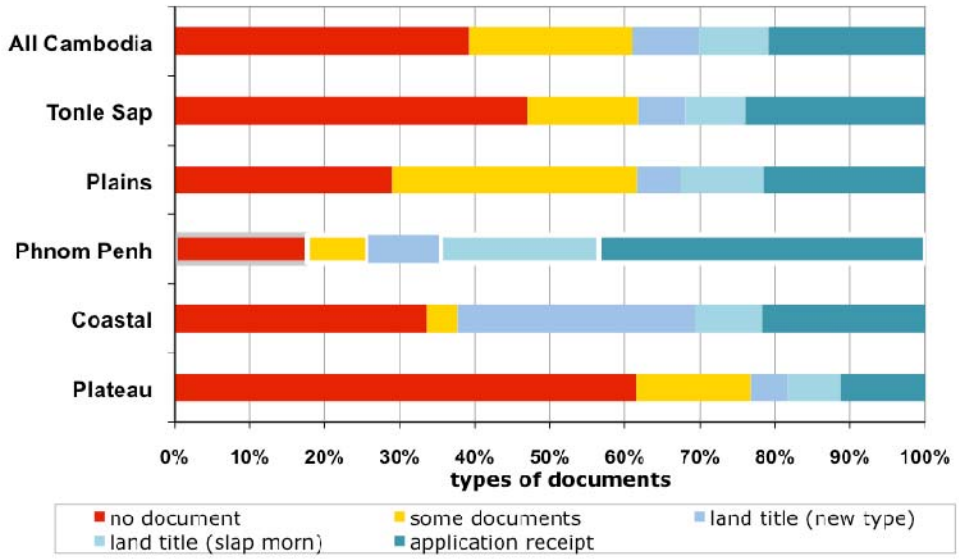
The chart above suggests that land insecurity, as expressed by the complete lack of land tenure arrangements, is a crucial problem in Cambodia. Differences were encountered in the five ecological zones. The Plateau/Mountain and Tonle Sap zones had the highest percentage of households without any property title. However, with the exception of Phnom Penh, Tonle Sap was also the ecological zone with the highest percentage of application receipts (Chart 16).

[27] World Bank, 2007, Cambodia: Sharing Growth : Equity and Development Report, p.56

[28] There are three official land titles in Cambodia:

- Application receipts (receipts of land sale agreement between buyer and seller);
- Slab morn, the old type of land title issued by Ministry of Land Management and Urban Planning and Construction in 1990s;
- New type of Land title (Land title that can be issued by Ministry and some Provincial Department of Land Management and Urban Planning and Construction such as Phnom Penh, Kampong Cham, Siem Reap, Battambang, etc.).

Chart 16: Legal documentation of land ownership by ecological zones



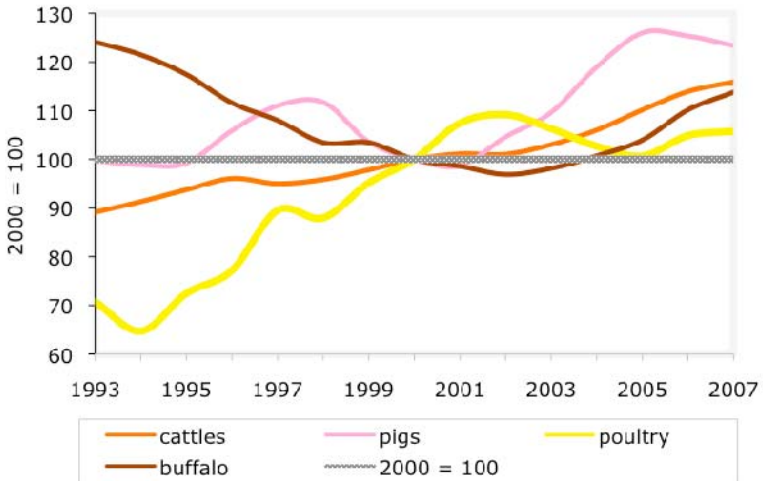
3.1.3 Livestock

Livestock production in Cambodia accounted for 4.6 percent of GDP (at current prices) in 2006 (NIS, 2007)[29] and was the second most important source of protein intake after fish. Raising cattle, buffalo, pigs and poultry holds high promises for growth. In addition, livestock is often well integrated into small-scale farming systems as farmers use cattle and buffalo in the rice paddies to plough, carry rice and perform other tasks. It is estimated that buffalos and cattle are the most important sources of draft and transport in the fields, representing 90 percent of the power needs for tillage and transport in rural areas[30].

According to the Ministry of Agriculture, Forestry and Fisheries (MAFF) data, cattle and buffalo production has increased gradually in the last 10 years. Likewise, the number of poultry significantly increased from about 11 million in 1993 to nearly 16 million in 2007. The raising of pigs is increasingly becoming an important income generation activity. Chart 17 below illustrates that, when taking the year 2000 as a reference, there was a significant percent increase in the number of all types of livestock. The strong demand for cattle and buffalo in neighboring Vietnam and Thailand is a source of export earnings with much potential. Although there is no official data on cattle export to neighboring countries, small and medium-scale export of Cambodian cattle is often reported to occur along the Thai and Vietnamese borders. This sector would largely benefit from a better control of the actual trade fluxes.

[29] NIS, 2007, National Accounts of Cambodia 1993-2006, p68.
[30] CDRI, 2001, Agriculture Sector in Cambodia, p7.

Chart 17: Trends in livestock availability between 1993 and 2007 (year 2000 = 100)



Source: MAFF/NIS, 1993-2007

Results of the HHQ survey indicated that two thirds of the surveyed households in rural areas own cattle and buffalo and approximately one-third of them also raise pigs. Differences exist between Phnom Penh and the areas defined as 'other urban areas'. While raising livestock and small animal is quite uncommon in Phnom Penh, approximately 10 percent of the households in other urban areas own cattle and buffalo and raise pigs as forms of urban and peri-urban agriculture.

According to qualitative information gathered from the household survey, people reported that raising pigs could be the best solution to regularly get cash income and to cover basic needs. It was estimated that raising pigs might provide an average monthly net income of about 100 US dollars (about 400,000 *riels*), the equivalent of approximately 140-150 kg of the best quality rice (in June 2008). However, the small–scale domestic piggeries that were observed in the urban outskirts might generate serious concerns for human health and health services because of the absence of sewage systems and the close proximity of humans and animals. Critical conditions, such as the dwellings of urban periphery that were partially occupied by unprotected pig barns, were often observed during field survey.

Access to Forest Resources

Forest resources are a source of important economic benefit for Cambodia. Timber exports provide considerable revenues in the form of foreign currency to the government. Rural livelihoods heavily rely on the collection of firewood and timber. It is estimated that 91 percent of the rural population in Cambodia primarily use firewood as the major source of fuel[31]. In some areas, rural households market forest products as well, and selling minor forest products is often a significant source of income[32].

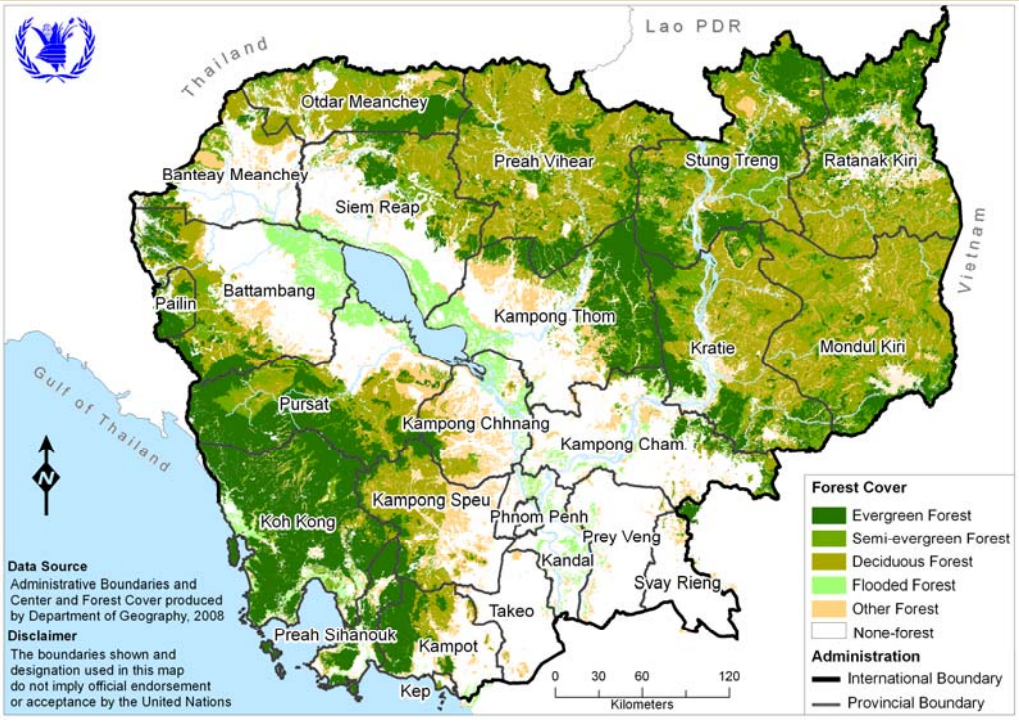
[31] Ministry of Planning, 2004, Cambodia Inter-Censal Population Survey 2004, p.38

[32] Most of the background information on forest resources is from the Cambodia Human Development Report, published in 2007, by the United Nations Development Programme (UNDP), reporting 2000 data.

Land clearing is frequently practiced in agriculture systems characterized by shorter rotations compared to traditional systems. The result is decreasing soil fertility and land degradation, provoking further pressure to clear new land. In 2007, UNDP reported that the government leased out approximately 3.4 million hectares of forests as forest concessions to private interests. This might be a potential source of conflict between the government and rural households, since many of them access and consider forests as a 'common property resource' and often rely on wild food. For instance, the VCL showed that forest resources and wild food are utilized and consumed by virtually all of the villages in the Coastal zone, more than three fourths in the Plateau/Mountain zone, and approximately half of the villages in the Plains and Tonle Sap zones.

Forests cover approximately 58 percent of the area of Cambodia (See Map 4). Recent remote sensing-based studies indicated that more than 75 percent of this forest area is currently disturbed by human influences. Mixed and mosaic land cover patterns then replaced the dense forest cover. These land cover changes might be associated with a qualitative degradation of forest resources and reduction in productivity. The total area of forested land is also declining. Between 1973 and 1997, it was estimated that more than 100,000 ha per year were lost with an annual rate of deforestation estimated between one and two percent. Main determinants for this decline were the increasing local and overseas demands for timber and fuel-wood, land clearing for agriculture, and human settlements. As in many other South East Asian countries, the unregulated exploitation of timber and illegal logging also are serious concerns that need to be urgently addressed.

Map 4: Forest cover in Cambodia



Sources: Department of Geography, 2008

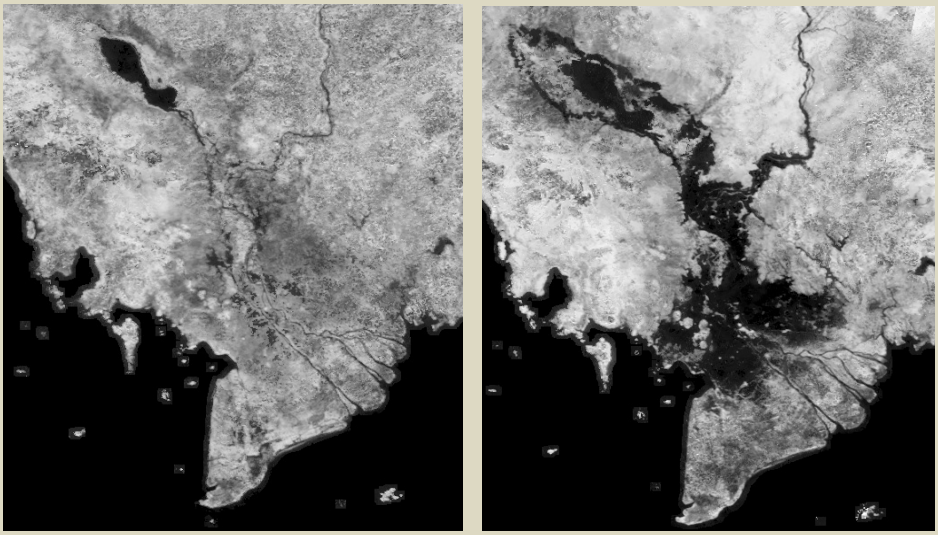
Box 2 - The Mekong 'time bomb'

The Mekong River crosses or borders all South East Asian countries. With its seasonally changing water levels, the Mekong is an extraordinary source of biodiversity and is associated with an immense variety of agro-ecological systems of which the Tonle Sap Great Lake system in Cambodia is one of the most relevant. The Tonle Sap Lake system strongly depends on the upstream Mekong floodwater and on its inter-annual variability. Accordingly, its area varies greatly, normally ranging between 2,500 km^2 up to 15,000 km^2 in the dry and the wet seasons, respectively.

The Tonle Sap Lake system is believed to be one of the most productive ecosystems in the world. Forests and rice fields occupy the surrounding floodplains. Rice production and the related fisheries are then the main elements of the local livelihoods. Overall, it is estimated that more than one-fourth of the Cambodian population, in six provinces, directly or indirectly depend on the lake and its floodplains for their livelihoods and that approximately five percent of entire Cambodian GDP comes from the Tonle Sap fish catches.

Its particular hydrological functioning makes the Tonle Sap area particularly prone to flooding and drought with serious consequences for the local vulnerabilities. Two satellite images of early September 1998 (the driest of recent years) and early October 2000 (during the full extent of the most recent episode of flooding) are useful to understand the magnitude of these variations. The black areas represent the water in the two images and its variations during the drought (1998) and the flooding (2000).

The satellite imagery makes evident that all up-stream interventions should be carefully planned to avoid the disastrous consequences that the altered functioning of this delicate ecosystem might cause. This is why the recent decision of the Chinese government to build large-scale dams up-stream was seen with great concern. The construction of these dams may drastically affect and change the traditional livelihood systems. For instance, swamps and wetland forests will likely be lost in the downstream areas and with them all the associated fishery resources.



This box is a revised excerpt of the text (written by P. Santacroce) from FAO/NRCB, SEA Poverty Hotspots, (unpublished document). The FAO/NRCB and the author are gratefully acknowledged for its use. Prof. Silvio Griguolo, Department of Planning, University of Venice, Italy is also thanked for having provided access to the Vegetation (VGT) Spot images.

The Mekong River (4350 km) starts from the Tibetan Plateau and assumes different names in different countries: Lancang Jiang (Turbulent River) in China, Mae Nam Khong in Thailand, Myanmar and Laos, Tonle Thom (Great Water) in Cambodia and Cuu Long (Nine Dragon) in Viet Nam.

3.2 Human Capital

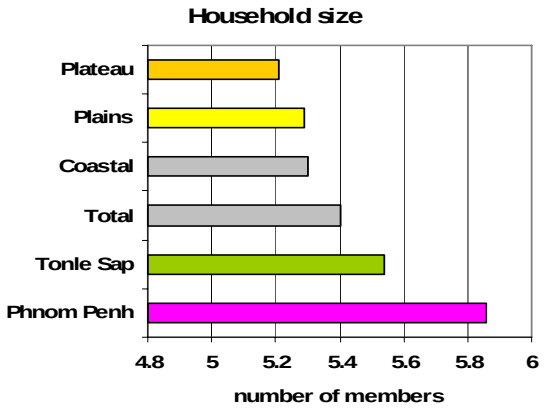
3.2.1 Demographics

The qualitative assessments gathered with VCL at village level, indicated that in the large majority of surveyed villages the human population has increased in recent years. Nonetheless, in nearly 10 percent of the surveyed villages the population has decreased. The highest prevalence of these villages is found in the Plains and Tonle Sap zones. This finding indicates that these areas are affected by migration dynamics more intense than the other regions.

Household Size

The HHQ survey found the average household size to be 5.4 persons. The household size does not significantly differ between urban and rural areas. A closer look, however, reveals that households are, on average, smaller in the Plateau/Mountain zone compared to Phnom Penh and the Tonle Sap ecological zone (Chart 18).

Chart 18: Household size by ecological zones

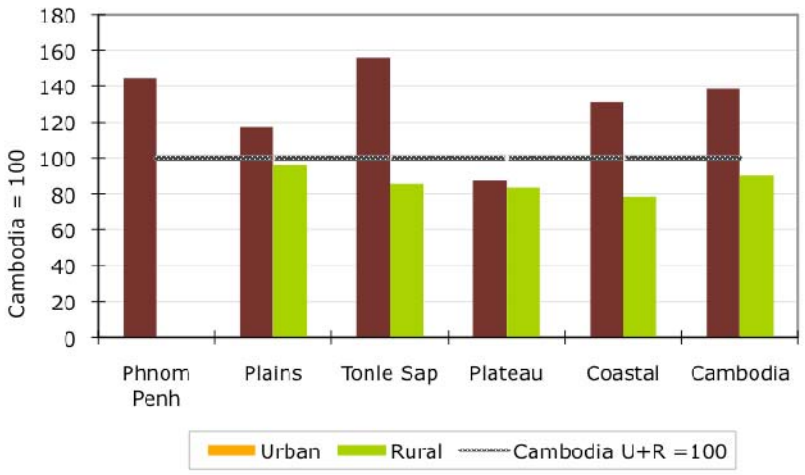


The age dependency ratio is the ratio of the population in the younger (0-14) and older (65+) age groups to the population in the age group 15 - 64 years within a household. The HHQ survey clearly indicated that the dependency ratio is higher in rural areas than in urban areas. In particular, significant differences exist between ecological zones. Nearly 50 percent of households in the Plains zone have a dependency ratio higher than 60 percent, while the proportion was only 30 percent in the Tonle Sap zone. In households with a high dependency ratio, only a single member of the household typically engages in cash-generating activity. The prevalence of high dependency households is much lower in the capital and in the Coastal zone where only three percent and eight percent of households had a high to very high dependency ratio, respectively.

Household Headed by Females

The survey showed that female-headed households are more frequent in urban areas (31.6 percent) than in rural areas (20.6 percent) (Chart 19).

Chart 19: Female-headed households by urban and rural strata and by ecological zone (overall Cambodia = 100)



3.2.2 MIGRATION

Literature on migration suggests that overseas migration has been increasing in East Asian countries. In Cambodia, overseas migration has become an increasingly common strategy for poor rural families to seek better opportunities and additional sources of income. Actual numbers of migrants are likely much higher than official figures given the extent of day labor migration, particularly to Thailand and Vietnam, and the high frequency of irregular migration that remains unrecorded.

The results of a study comparing the 1996 sample survey with 1998 census data suggested that rural out-migration is increasing[33]. According to the Cambodia Inter-Censual Population Survey (CIPS) 2004, approximately 35 percent of the Cambodian population are migrants, an increase of four percent over the Population Census of 1998 (31 percent) (Table 3).

Table 3: Percentage of migrants

Sex	Population Census 1998			CIPS 2004		
	Cambodia	Urban	Rural	Cambodia	Urban	Rural
Both sexes	31.5	58.9	21.35	35.1	56.2	31.2
Males	32.5	58.7	27.5	35.2	54.2	31.9
Females	30.5	59.1	25.28	35.1	58.1	31.0

Source: Population Census 1998 & CIPS 2004

The CIPS 2004 also reported on the destination of migrants. It was found that 61 percent of all migrants moved from one rural location to another, 16.4 percent from rural to urban, 9.4 percent from urban to rural, and 13.2 percent from one urban

[33] Sarthi Acharya, 2003, Working Paper on Migration and Urbanization, p.4.

location to another. Table 4 below illustrates the changes of migration-relevant data between 1998 and the study of 2004. Migrations from rural to other rural locations remained the most represented category between the two years.

Table 4: Distribution of migrants in the last five years by destination, percentages

Destination	Population Census 1998			CIPS 2004		
	Both sexes	Males	Females	Both sexes	Males	Females
Rural to rural	58.2	59.6	56.7	61.0	62.7	59.1
Rural to urban	19.2	18.5	20.1	16.4	15.2	17.8
Urban to rural	8.05	8.1	8.0	9.4	9.9	8.8
Urban to urban	14.5	13.8	15.3	13.2	12.3	14.3

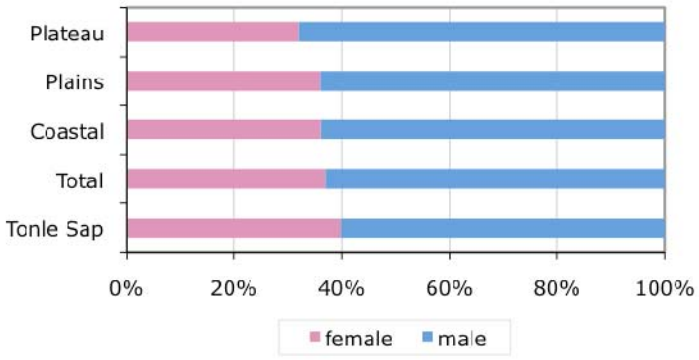
Source: Population Census 1998 & CIPS 2004

Migrations often entail significant changes in the household structure since women and older members stay in the villages and continue working the land. Information in the 2006 Poverty Assessment of the World Bank suggests that while wages are not much different in urban and rural areas, it is often the higher probability of finding employment that drives migration. Seasonal migration might then offer an important opportunity for large families facing unemployment and under-employment. Remittances are a crucial component of migration. Data on remittances is scarce and highly unreliable due to the difficulty in accurately compiling and reporting such information. In many cases remittances are made in-kind or are sporadic. More information on remittances would be of great value to better understand the impact that migration has for the life of those that remain behind. It might be particularly important to further explore the implications of migration and remittances on the food security of Cambodian households.

The Plains and the Tonle Sap ecological zones had the highest prevalence (20 percent and 23 percent, respectively) of households with at least one member working elsewhere. Below average values (approximately 19 percent at national level) were instead encountered in the Plateau/Mountain and Coastal ecological zones (12 percent and 15 percent, respectively).

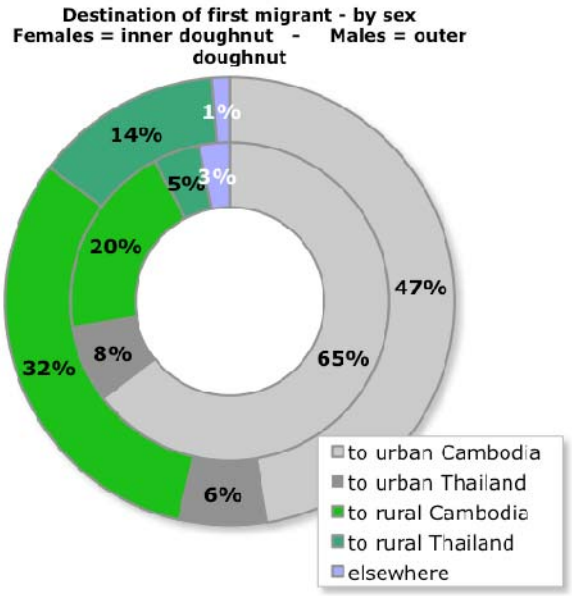
The 2008 CFSVA found that nearly 19 percent of Cambodian households had at least one member that was working elsewhere as a migrant. About three out of five migrants were men (63 percent males) (Chart 20). The male mean age was significantly higher than the female mean age (27 versus 22 years, respectively). The Tonle Sap zone had the highest percentage of female members working elsewhere and the Plateau/Mountain zone had the least. The migration flows from the Tonle Sap and Plateau/Mountain zones are composed mainly of young women (aged less than 24 years), while women migrants aged 24 - 30 years are more represented in the Plains zone. In general, with the exclusion of the Coastal zone, the migration of women aged above 30 years is negligible.

Chart 20: Percentage of households members working elsewhere, by sex and by ecological zone (first migrated member only)



Young males and females below the age of 24 are those migrating more frequently. There are significant differences among sexes in the destination of migration (Chart 21). Women primarily migrate to urban areas within Cambodia. However, men migrate more frequently to rural areas (47 percent to rural Cambodia and 32 percent to rural Thailand). The Tonle Sap zone is the main origin of migration to Thailand, which receives 38 percent of male migrants from this ecological zone. This confirms the economic and social importance of trans-border migration.

Chart 21: Destination of migrants by sex



The survey found significant gender differences between migrants with respect to their destination.

The inner doughnut of Chart 21 refers to the principal destinations of female migration, whereas the outer doughnut illustrates the destinations of male migrants.

3.2.3 Education

Primary Education

Cambodia made considerable progress in expanding basic education in recent years. With the abolition of school fees in 2001, the enrolment rates in primary and secondary

schools, as well as transition rates from primary to secondary levels, have all shown varying degrees of improvement in the first half of this decade (Table 5).

Table 5: Proportion of children aged 7 to 24 attending school/educational institutions

Age group	Percentage of School Attendance		
	Both Sexes	**Males**	**Females**
7-9	81	80.2	81.9
10-14	89.9	90.9	88.9
15-19	48.7	56.9	40.2
20-24	9.1	12.5	5.8
Total	59.1	62.8	55.3

Source: CIPS, 2004

According to the World Development Report 2007/08, the Cambodia's Net Enrolment Ratio increased from 69 in 1991 to 99 in 2005[34] (Table 6). The Net Enrolment Ratio is the ratio of total enrolment of children of official school age based on the International Standard Classification of Education 1997 to the population of the age group that officially corresponds to the level of education shown. Enrolment ratios help to monitor two important issues for universal primary education: whether a country is on track to achieve the Millennium Development Goal of universal primary completion by 2015, which implies achieving a net primary enrolment ratio of 100 percent, and whether an education system has sufficient capacity to meet the needs of universal primary education, as indicated in part by its gross enrolment ratios. The difference between gross and net enrolment ratios shows the incidence of overage and underage enrolment.

Table 6: Cambodia's Net & Gross Primary School Enrolment Ratio

	1991	**2005**
Net Enrolment ratio (Percent of relevant age group)	69	99
Gross Enrolment ratio (Percent of relevant age group)	-	134

Source: UNDP HDR 2007/08

The gender ratio increased from 0.82 to 0.92 in existing schools, and from 0.86 to 0.95 in new schools, during the academic years 2003-2004 and 2005-2006, respectively. This represents an increase of 10 girls for every 100 boys in existing schools and nine girls for every 100 boys in new schools[35].

Despite this progress, high dropout rates and scarcity of trained teachers, especially in remote rural areas, remain major concerns for Cambodian education. The number of primary teachers has increased by only seven percent since 1993, compared with a 69 percent increase in enrolment, resulting in a high pupil-teacher ratio of 49:1[36]. A key factor contributing to high dropout rates is the high proportion – 21.2 percent – of 'incomplete' schools, which are unable to offer the full six years of primary education[37].

The survival rate (the proportion of students who stay in education) from grade one to grade nine has fallen from 33 percent in 2001 to 29.3 percent in 2005 as against a target of 52 percent (UNDP, 2007)[38]. The World Bank report 'Cambodia Quality Basic

[34] UNDP 2007, World Development Report 2007/08, p.271
[35] Ministry of Education, Youth and Sport, Education Management Information System 2007-2008
[36] Ministry of Education, Youth and Sport, Education Management Information System 2007-2008
[37] Ministry of Education, Youth and Sport, Education Management Information System 2007-2008
[38] UNDP 2005, Cambodia's Progress Towards Achieving the Cambodia MDGs, p.viii

Education for All', indicates that the overage enrolment is caused by late school entry, slow progress through school, or a combination of the two. EMIS data reports significant overage intake and enrolment that increases with the level of schooling. The CCLS (Cambodia Child Labour Survey) states that approximately 72 percent of children who enter school for the first time are older than six and that most children in secondary school are actually over-aged. CCLS also reports that approximately 40 percent of school-aged children entered school at ages eight and above[39].

Literacy Rates

The CSES 2004 data reported that the total literacy rate was 67.1 percent, with male literacy higher than female literacy rates (Table 7) in both urban and rural areas. The general literacy rate is highest in Phnom Penh and in other urban areas and much lower in rural areas.

Table 7: Percentage literacy rate among population aged 7 years and above by sex and urban and rural strata

Sex	Stratum			
	Cambodia	Phnom Penh	Other Urban	Rural
Both sexes	67.1	89.1	75	63.5
Male	74.4	93.9	80.5	71.3
Female	60.3	84.7	69.6	56.3

Source: CSES, 2004

Adult literacy rate is defined as the percentage of literate persons aged 15 and above to the corresponding population. Adult literacy rates were considerably higher for males than females in urban and rural areas in 1998 and 2004, although the gap was slightly lower in 2004 (Table 8). The most notable feature has been the little progress made in increasing adult literacy during the period 2001-2006. Overall literacy rate was 83.5 percent in 2004 and still far from the 90 percent set as target by the Cambodia's MDG for 2005[40].

Table 8: Literacy rates in Cambodia in 1998 and 2004

Sex	Stratum	Percentage Literate	
		1998	2004
Both sexes	Total	62.8	74.4
	Urban	75.5	83.5
	Rural	60.3	72.7
Males	Total	71.0	82.1
	Urban	82.1	88.9
	Rural	68.8	80.8
Females	Total	55.4	67.4
	Urban	69.3	78.7
	Rural	52.7	65.3

Source: CIPS, 2004

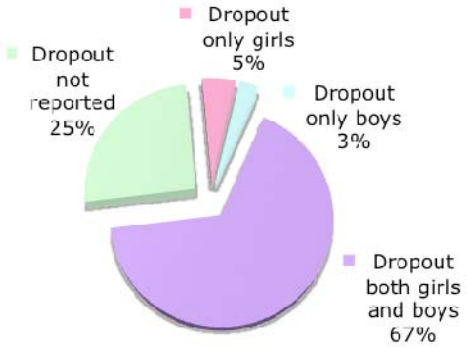
[39] World Bank, 2005, Cambodia Quality Basic Education for All, p.17

[40] UNDP, 2005, Cambodia's Progress Towards Achieving the Cambodia Millennium Development Goals, p.viii

ATTENDANCE AND DROPOUT

The CFSVA survey has investigated the impact of food price rises both at village and household levels. The VCL showed that three out of four villages were somewhat affected by dropout phenomena. In most cases, dropout affected both girls and boys, whereas in a few villages (eight percent) the dropout prevalence appeared to have a gender bias (Chart 22).

Chart 22: Dropout prevalence as reported by VCL (percentage of surveyed villages)



The school year in Cambodia starts on 1 October and ends on 31 July. The VCL demonstrated that dropout has a clear seasonal pattern. Chart 23 illustrates that the majority of dropout events occur during the spring, peaking in May-June (smoothed averages were used). The school dropout starts and reaches its peak in different periods in the five ecological zones. An earlier peak was reached in Plain and Tonle Sap zones. The seasonal shapes of the Coastal and Plain zones were more similar to the national shape, while the Tonle Sap zone showed a steady dropout increment during the entire school year. The Tonle Sap zone had the highest prevalence of villages that were affected by school dropout, whereas there were not significant differences between the other ecological zones. It is interesting to note the dichotomy between Phnom Penh and the other areas (Chart 24).

Chart 23: Seasonal pattern of dropout rates

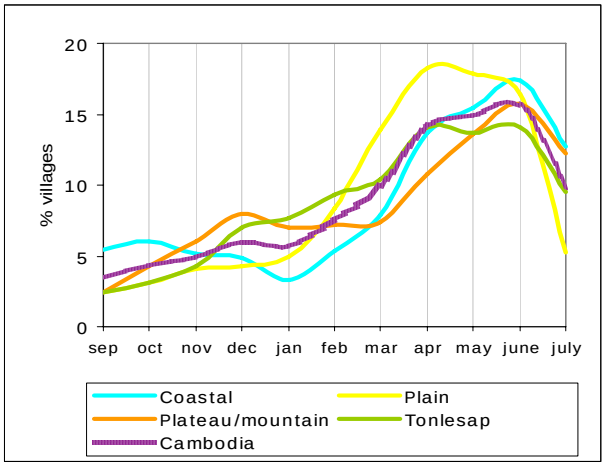
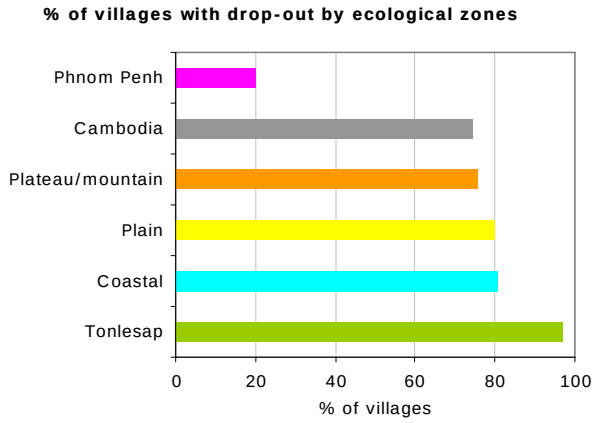


Chart 24: Dropout by ecological zone (percentage of villages)



Children not Attending Primary School

Through the HHQ survey it was possible to quantify the number of children between six and 12 years old (primary school age) not attending school at the beginning of June 2008 and the main reasons for missing school. Although 'not attending' is not equivalent to 'dropout', the difference in the 'non attending' rates in December 2007 and June 2008, might be used as proxy for dropout rates.

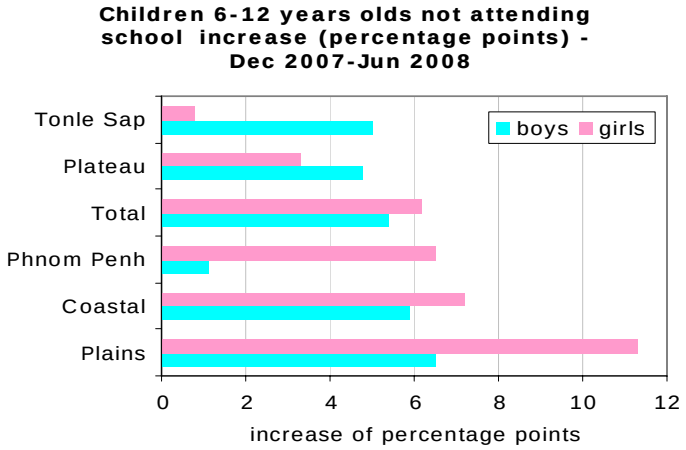
In June 2008, the percentage of children not attending school was significantly high, particularly in the Plateau/Mountain and Plains ecological zones (Table 9). Results from the HHQ survey indicated that the dropout figures nearly doubled between December 2007 and June 2008. This coincides with the seasonal pattern in dropout rates described earlier in the text. Household survey results showed a higher proportion of girls than boys that was not attending school in December 2007 and June 2008. With the exception of the Coastal area, this higher percentage was common to all ecological zones. In December 2007, approximately one out of 13 girls did not attend school, compared to one out of 18 boys. The most striking difference was found in the Tonle Sap zone where one out of 11 girls did not attend school, as opposed to one out of 24 boys for the same area. The difference was reversed in the Coastal ecological zone, where more boys than girls were reported not attending school. Overall, gender-based differences were less important but still present in June 2008 (one out of seven girls versus one out of nine boys). In the Plains zone and Phnom Penh, however, sharp increases were observed as the school year progressed.

Table 9: Percentage of boys and girls (6-12 years old) not attending school

	Boys not attending		Girls not attending	
Ecological zone	Dec 2007	Jun 2008	Dec 2007	Jun 2008
Phnom Penh	0%	1%	2%	9%
Plains	5%	12%	7%	18%
Tonle Sap	4%	9%	9%	10%
Plateau/Mountain	11%	16%	12%	15%
Coastal	7%	13%	4%	12%
Cambodia	6%	11%	8%	14%

Chart 25 summarizes the increases (expressed in percentage points) of girls and boys reported not attending school in December 2007 and June 2008. It should be noted that the reported values for June 2008 corresponded with the peak of 'not-attendance' for a typical year.

Chart 25: Children 6-12 years not attending school



Reasons for Non Attendance

The CFSVA also investigated the main reasons for 'Not attending school'. Unfortunately, when requested to provide the reasons for not sending one or more of their children to school on June 2008, nearly one-third of the households replied with a laconic 'Don't know/can't say'. This answer was treated as 'Lack of information' and consequently these responses were not processed when trying to identify prevalent reasons. Despite this limitation, the following categories emerged from the analysis of results: 1) Economic reasons (32 percent of responses); 2) Distance of the school/security problems/scarce quality (25 percent of responses); and 3) Pupil attitude – lack of interest, poor performance (19 percent of responses).

The survey outcomes offered additional gender-related information with regard to the lack of attendance (Table 10). Lack of interest, scarce results and security were more relevant for girls, while economic limitations were less frequently reported.

Table 10: Reported reasons for non attending school

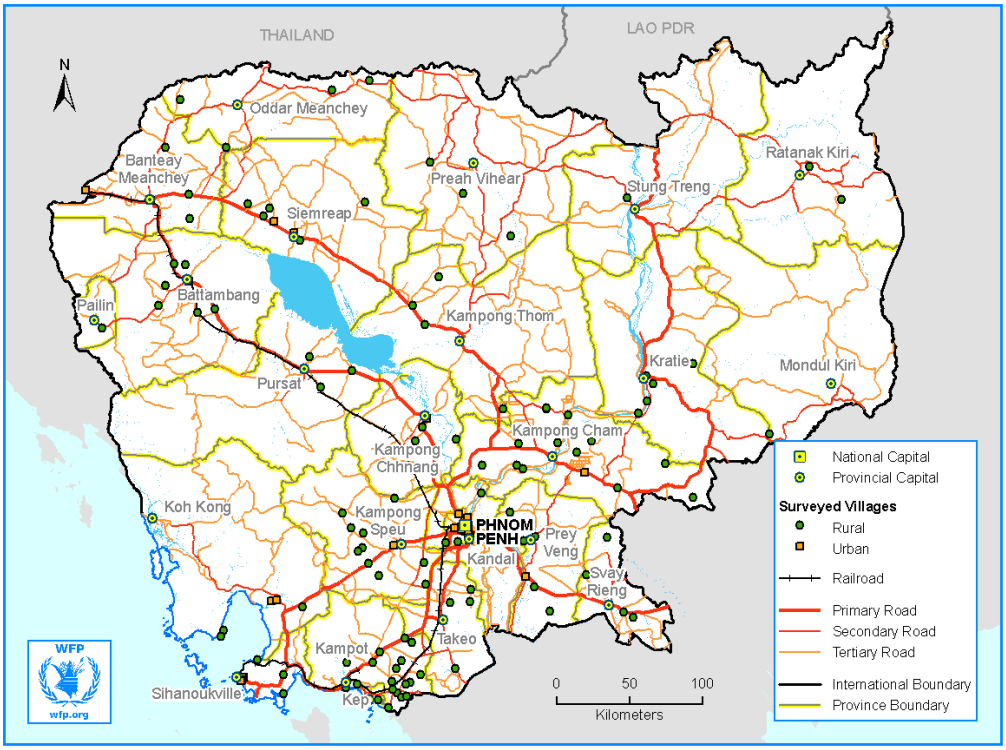
Coefficient of feminization: % Girls/%(Boys + Girls) * 100	
Don't want to / not interested	115
Not good at school	130
Disability/illness	49
School too far away/safety concern	102
No teacher / no supply / poor quality teaching	97
Household economic reasons	96
Other reasons	80

3.3 Physical Capital

3.3.1 Physical Access - Transport Infrastructure

Cambodia has a poor transport infrastructure. These were heavily affected by the past conflicts and civil war. The poor transport structures imposes higher costs and delays on travel, raising the costs of marketing goods or obtaining inputs, and limiting access to health and education facilities. Map 5 shows that most of the country population utilizes tertiary roads. Existing infrastructure services mainly concentrate in urban areas, where only 15 percent of Cambodian households are located[41]. Coverage and access to infrastructure services in Cambodia is poor compared with neighboring countries and even with countries of similar income levels.

Map 5: Road system in Cambodia



This unequal distribution of transport infrastructure has the highest impact on the poor and very poor households living in rural areas. According to CSES 2004, the least developed transport infrastructure is found in the Mountain/Plateau and in the Tonle Sap zone[42] when measured by the percentage of villages with all-weather roads (and lack thereof). Based on the qualitative assessment of key informants, 15 percent of the surveyed villages in Cambodia are not accessible by car all year long. In the Plains ecological zone, nearly half of the surveyed villages cannot be accessed by car all year long.

In the agricultural sector, inadequate access to road infrastructure and transport acts as an impediment to increasing farm productivity. This is because it raises the cost of

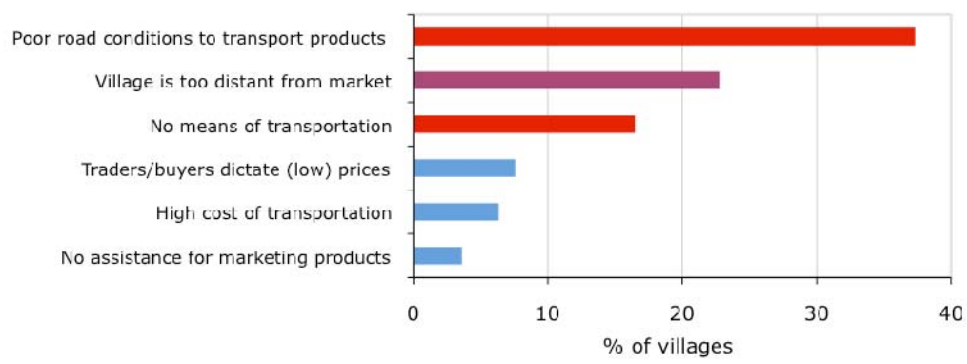
[41] National Institute of Statistics, 1999, General Population Census 1998, p.35-36.
[42] World Bank, 2006, Cambodia: Halving Poverty by 2015, p.45.

trade, lowers the farm-gate price of production, and increases risks and transport losses for marketing of higher value, perishable products[43].

ACCESS TO MARKET AND MILLING

The VCL revealed that only 20 percent of the surveyed villages had a market at the time of the survey. The Plains zone had the largest prevalence of villages where the market is far and not easily accessible. Limitations in physical accessibility often overlap with economic and financial constraints. Chart 26 summarizes the most relevant constraints as reported in the VCL. Physical accessibility (physical and transport costs) was the main limitation reported in the majority of responses. Financial limitations, such as the dependency on prices dictated by traders, and the difficulty of matching demand characteristics, were the second and third most frequently reported types of constraint. To facilitate the reading of the chart, the three conceptual groups were marked with different colors (red for transport limitations, purple for price-related constraints with trades, and light blue for difficulties in meeting product demands. Physical accessibility to markets was a more stringent limitation in the Plains and Plateau/Mountain zones, while the dependency on traders was relatively more important in the Tonle Sap ecological zone.

Chart 26: Main constraints on the access to market



The absence of a rice miller in the village is a common limitation on physical and economic access for rural Cambodians. Access to milling facilities is a basic necessity for farmers, and particularly for poor farmers who do not have domestic milling facilities. More than 20 percent of the villages did not have a rice miller at the time of the survey. In addition, the farmers complained about the high increase in the price of milling services, not justified (according to them) by increasing energy costs.

3.3.2 ASSET OWNERSHIP AND THE WEALTH INDEX

The survey asked households if they owned a series of 16 assets including productive assets (agricultural tools, transportation) and non-productive assets (household items such a radio, TV, cell phones, etc). Among productive assets, the most commonly owned were a plough (29 percent), a cart (24 percent) and a sewing machine (10 percent). Urban areas and Phnom Penh had a higher percentage of households owning

[43] World Bank, 2006, Cambodia: Halving Poverty by 2015, p.75.

sewing machines and taxis, most likely due to more diversified income activities that characterize the urban environment (Table 11).

Among the non-productive assets, many households reported owning a television (48 percent), a bicycle (70 percent), a radio (50 percent) and a battery for lighting (53 percent) (Table 11).

Table 11: Asset ownership (percentage of households)

	Cart	Plough	Hand tractor	Car taxi	Sewing machine	Tractor	Thresher	Rice-mill
Phnom Penh	2%	1%	0%	15%	20%	0%	0%	0%
Plains	17%	28%	10%	6%	9%	1%	2%	4%
Tonle Sap	33%	32%	9%	3%	10%	0%	2%	3%
Plateau	38%	39%	14%	3%	6%	1%	1%	6%
Coastal	25%	32%	2%	4%	8%	0%	0%	2%
Urban	3%	3%	1%	12%	20%	0%	0%	1%
Rural	29%	35%	11%	4%	7%	1%	2%	4%
Cambodia	24%	29%	9%	5%	10%	1%	2%	4%

	Radio	Television	Cell phone	Bicycle	Motorbike	Water pump	Cash or other savings	Battery for lighting
Phnom Penh	70%	95%	85%	44%	78%	3%	58%	7%
Plains	49%	73%	45%	76%	50%	45%	46%	60%
Tonle Sap	50%	57%	37%	75%	40%	14%	37%	57%
Plateau	46%	38%	28%	55%	43%	7%	33%	57%
Coastal	45%	49%	44%	60%	41%	7%	41%	39%
Urban	61%	88%	82%	59%	70%	17%	58%	12%
Rural	47%	58%	35%	72%	42%	27%	39%	63%
Cambodia	50%	64%	44%	70%	48%	25%	43%	53%

Wealth refers to the value of all natural, physical and financial assets owned by a household. The Wealth Index is not meant to measure the entire wealth of a household (for instance, it does not include the natural and financial wealth), but it is rather a proxy measure for it. The components used in the construction of the Wealth Index are typical assets and amenities that, if owned by the households, are assumed to be relatively independent from the livelihood the households engage in. This implies that not all the amenities and assets reported during the household survey were used to build the Wealth Index. The ownership of the following assets (or socio-economic proxies) was investigated, assuming that these would be a comparable measure of wealth for both urban and rural areas:

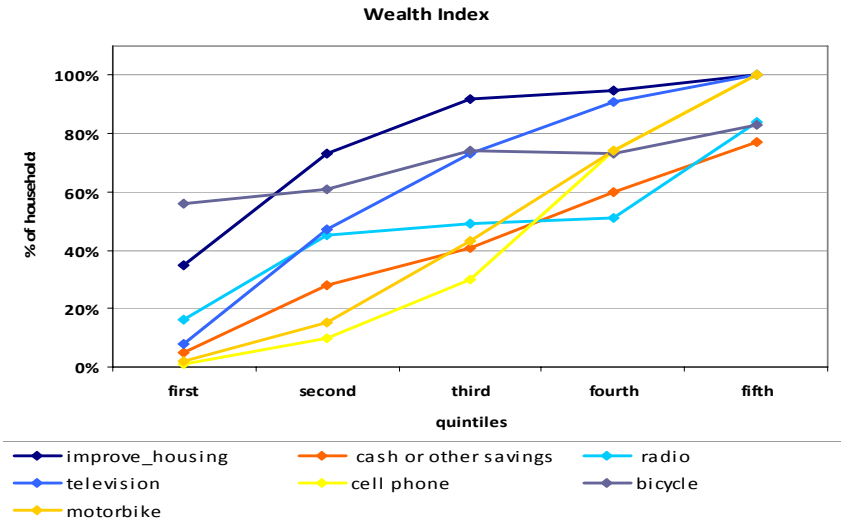
- Television
- Cell phone
- Motorbike
- Bicycle
- Cash or credit availability
- Improved housing materials (if the house is private in durable materials or with tin roof or a flat in multi-storey building)

A Principal Component Analysis (PCA) (a statistical technique commonly applied to compute the Wealth Index in CFSVAs) was then conducted using asset ownership data.

The first principal component was retained and the wealth quintiles – e.g. poorest (fifth quintile), poorer (fourth), moderate (third), richer (forth), and richest (fifth) – were developed. It should be noted that 'productive assets' (including livestock, hoes, axes, and hand hammer mills) were excluded from the development of the Wealth Index because these variables are primarily associated with the livelihoods of poor rural households.

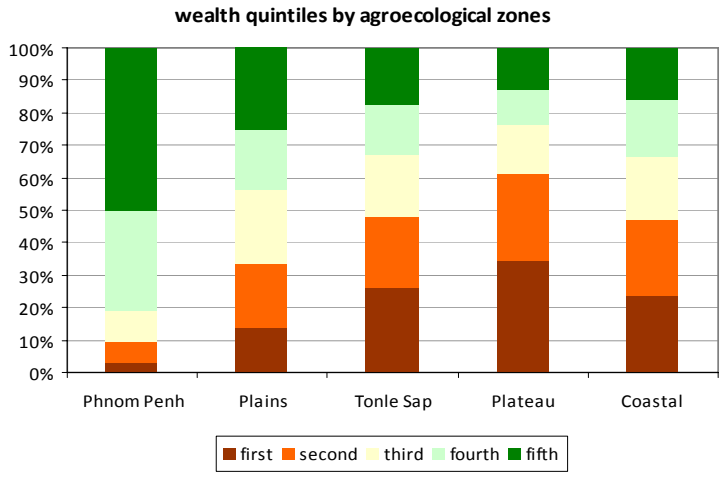
Chart 27 below illustrates that the households belonging to the lower quintiles (first and second) have less asset ownership.

Chart 27: Wealth Index quintiles



The Plateau/Mountain zone had the highest prevalence of households belonging to the first and the second wealth quintiles (60 percent), followed by Costal and Tonle Sap zones, whereas in Phnom Penh, 50 percent of the surveyed households belonged to the richest wealth quintile (Chart 28). The poorest wealth quintiles also have the highest percentage of female-headed households (29 percent and 26 percent) as opposed to 15 percent of female-headed households in the richest quintile.

Chart 28: Wealth Index quintiles by ecological zone



Box 3 - 'Quick collection' of indicators on cash availability

Primary data collection is always very expensive and sometimes the results are rather unsatisfactory due to many voluntary and involuntary factors. In any country, when it's necessary to get an extremely rapid, although very rough, assessment of the overall situation of a large area, experience has suggested visual proxy-indicators can be useful.

Obviously these 'at a glance' visual proxy-indicators are strongly related to local characteristics and require some preliminary knowledge of local behaviour. In some countries the frequency of adult people walking to the market without shoes along the main road (and consequently easily detected and counted) or of children sitting in front of their huts without shoes is an acceptable proxy to measure destitution. In other countries the frequency of women dressing in poor clothes when visiting the local market (and easily to be detected and counted) seems to work well.

In Cambodia two visual proxy indicators have been identified: the presence and/or the quantities of (i) water-harvesting containers and (ii) cement pedestal of the palafitte dwellings.

It has been observed that the better off own a higher number of water containers (big glazed terracotta jars), which are frequently ingeniously connected with roof water harvesting pipes. Most of the worse-off groups own a small quantity of jars, or even don't own any at all but collect water into provisional containers such as fuel barrels. During the survey the price of jars was collected. The price of a middle quality jar of about 0.33m^3 varies from 10,000 to 35,000 *riels*.

A second, interesting possibility is offered by the presence of cement pedestals on palafitte dwellings. There is strong evidence that this indicator is connected with the household's affordability. In June 2008 the price of a cement pedestal, according to the type (small or big height) was in local markets between 17,000 and 25,000 *riels*.

When visiting villages WFP frequently observed the presence of cement pedestals not yet placed. A frequent answer was: 'due to the cost of pedestals we buy them when money is available, once the full set is here we will proceed in the installation'. In any case it is extremely easy, when quickly passing through a village, to count the frequency of cement pedestals.

Summary of Chapter 3

This chapter has analyzed many of the diverse components of the natural, human, and physical capital of the surveyed households. Some general considerations arise from the analysis. Despite the progress made by Cambodia in recent decades (surplus of agricultural production, improvement of education, and construction of new transportation facilities), there are many areas that require further development. For instance, the lack of physical accessibility remains a significant problem hampering the livelihoods of rural households. In the future, increased attention should be given to the management of natural resources as diverse and potentially conflicting interests are at stake (e.g. for forest and water resources). The survey also highlighted the need for more detailed information on important components of the asset endowments. The role of remittances may significantly improve the understanding of overall migration patterns and of their impact. Qualitative information on the reasons for not attending school could support a better understanding of the differences between sexes that were suggested by the survey, and to address them accordingly.

4. Economic Capital and Household Livelihood strategies

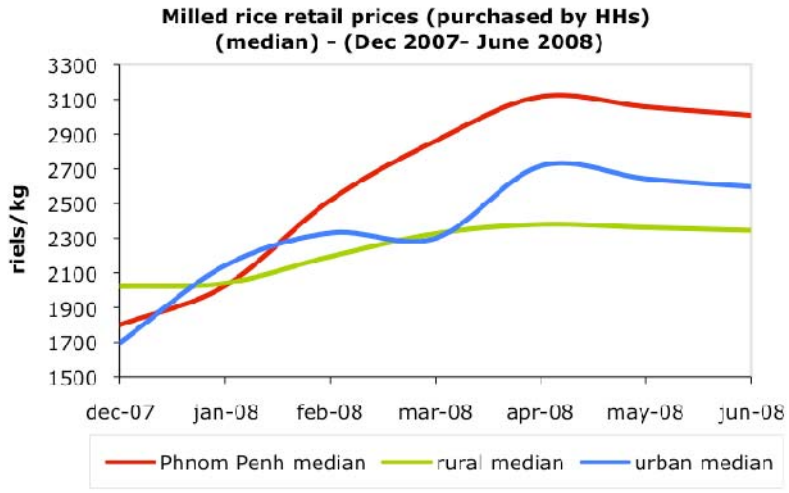
Outline of the Chapter

In 2008, the structural and seasonal limitations to local livelihoods were further exacerbated by the increase in the price of food. The analysis investigates several variables such as the changes in prices of milled rice, qualitative information on the costs for milling rice, and changes in the terms of trade of households, to better understand the impact of rising food prices on Cambodians. Elements of economic capital, such as income and expenses, are explored in this chapter. Households' livelihood activities are intimately linked to their economic capital and livelihood strategies determine access to food. As such, they are critical components to explore in the analysis of food security.

4.1. Trends in the Prices of Rice

Chart 29 presents survey information on the prices of milled rice as purchased by households for the period December 2007 to June 2008 (time of the survey), disaggregated by urban and rural areas. The highest increase throughout the period was found in Phnom Penh. Overall urban areas experienced higher increases than rural areas. At the time of the survey, prices had, however, stabilized in all locations.

Chart 29: Retail prices of milled rice as purchased by households



Price data were further disaggregated by ecological zone to unveil the variability existing within the zones due to diverse local market conditions and crop calendars. For instance, Chart 30 below shows significant variability across the rural areas of the ecological zones. While the analysis of the information on local crop calendars gathered from village key informants (Table 12) provides some hints to understand this variation, other factors contribute as well. For instance, it is likely that the harvesting of the dry season (February to April) was mainly responsible for the decrease in the prices of milled rice in the Tonle Sap zone. Other elements than the crop calendar are, however, likely to play a role in the regional patterns illustrated in Chart 30. For example, in the Coastal zone, rice prices declined in March 2008, although there was not a dry season harvest available in this region.

Chart 30: Milled rice retail prices in rural areas (January – June 2008)

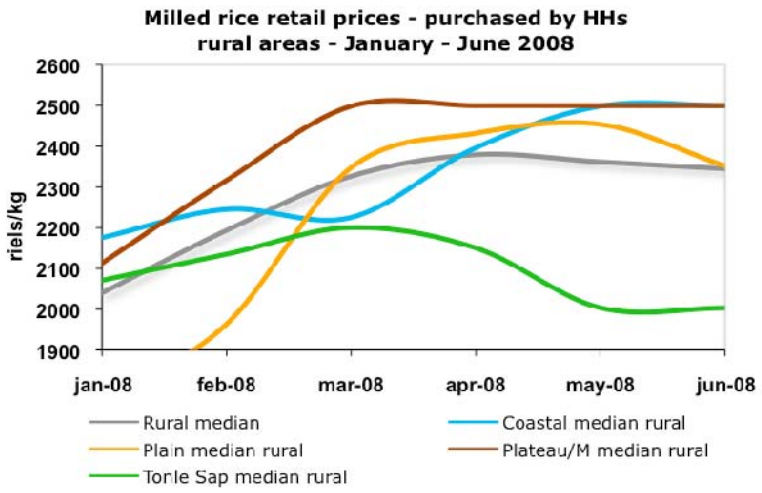


Chart 31 shows the variations in the retail prices of milled rice in the urban areas of the five regions. Comparison of trends in Chart 30 and Chart 31 suggests that significant differences exist between the urban and rural areas of the same region.

Chart 31: Milled rice retail prices in urban areas (January – June 2008)

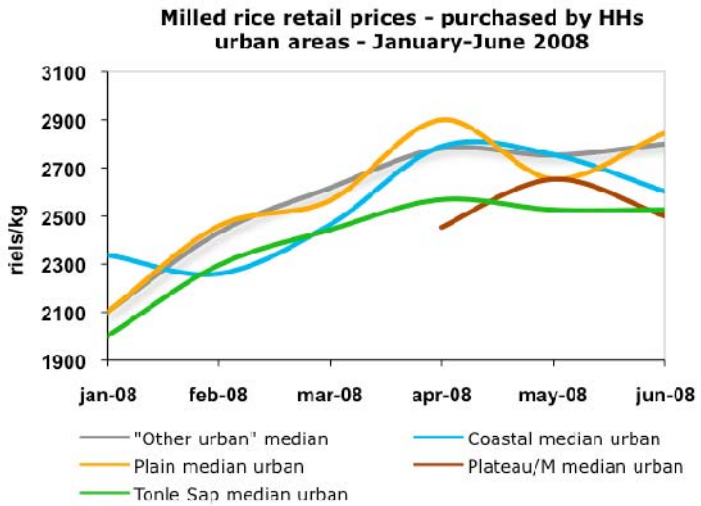


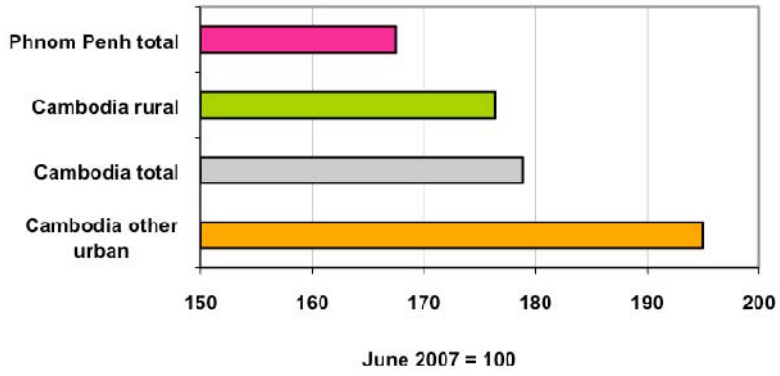
Table 12: Rice crop calendars - wet and dry season

Provincial name	Eco zone	Wet/ Dry	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Kampong Cham	Plain	Wet				P/TP	P/TP				H	H		
		Dry	H							P/TP	P/TP		H	H
Kandal	Plain	Wet				P/TP						H	H	
		Dry	H	H							P/TP	P/TP		
Prey Veng	Plain	Wet				P/TP	P/TP	P/TP			H	H	H	
		Wet		P/TP	P/TP			H	H					
		Dry	H	H							P/TP	P/TP	P/TP	
Svay Rieng	Plain	Wet					P/TP	P/TP	P/TP			H	H	
Takeo	Plain	Wet						P/TP	P/TP	P/TP		H	H	H
		Dry	H	H	H							P/TP	P/TP	P/TP
Banteay Meanchey	Tonle Sap	Wet			P/TP	P/TP	P/TP					H	H	H
		Dry	H	H								P/TP	P/TP	
Battambang	Tonle Sap	Wet				P/TP	P/TP					H	H	H
		Dry			H	H								P/TP
Kampong Chhnang	Tonle Sap	Wet	H		P/TP	P/TP								H
		Dry	H	H							P/TP	P/TP		
Kampong Thom	Tonle Sap	Wet			P/TP	P/TP						H	H	H
		Dry	H	H								P/TP	P/TP	
Pursat	Tonle Sap					NA								
Siem Reap	Tonle Sap	Wet		P/TP	P/TP	P/TP					H	H	H	
		Dry	H	H								P/TP	P/TP	
Kampong Speu	Plateau	Wet					P/TP	P/TP	P/TP		H	H	H	
Kratie	Plateau	Wet			P/TP	P/TP	P/TP					H	H	H
		Wet	H					P/TP	P/TP	P/TP			H	H
Mondul Kiri	Plateau	Wet				P/TP	P/TP				H	H	H	
Preah Vihear	Plateau	Wet			P/TP	P/TP				H	H	H		
Rattanak Kiri	Plateau	Wet			P/TP	P/TP				H	H			
Stung Treng	Plateau	Wet				P/TP	P/TP			H	H	H		
Oddar Meanchey	Plateau	Wet			P/TP	P/TP				H	H			
Pailin	Plateau	Wet			NA									
Kampot	Coastal	Wet				P/TP	P/TP				H	H	H	
Koh Kong	Coastal	Wet			P/TP	P/TP	P/TP			H	H	H	H	
Preah Sihanouk	Coastal	Wet				P/TP	P/TP				H	H		
Krong Kep	Coastal	Wet			NA									

P: planting TP: transplanting H : harvesting

The CFSVA survey gathered village-level data to further explore the variability of prices in the surveyed villages. Key informants were asked to make a yearly comparison of prices between June 2008 and the same period in 2007. The qualitative and quantitative information of the above charts cannot however be directly compared since the two types of information refer to two different periods (June 2007 to June 2008 for the qualitative assessment and the first six months of 2008 for the quantitative analysis). In addition, limitations due to errors in recalling data should be noted. However, both household and village level information agreed that the increase was higher in urban areas compared to the rural zones (Chart 32). Survey information gathered average prices without distinction for the diverse qualities of purchased rice.

Chart 32: Yearly increases in the price of the most frequently purchased quality of rice between June 2007 and June 2008 as reported by key informants (June 2007 = 100)



The qualitative information was further disaggregated by ecological zones and by rural and urban areas, and results are shown in Charts 33 and 34, respectively. The rural areas in the Coastal and Tonle Sap zones had the highest increase in the prices of rice between June 2007 and June 2008. According to key informants, market prices in the Tonle Sap zone were influenced by the fact that this zone produces the most appreciated quality of rice for which Thai merchants typically offer higher prices. In addition, the paddy rice in this region is often exported to Thailand before returning as milled rice (reentering the market at a higher price). For urban areas, the Plains zone recorded the highest increases in rice prices during the reference period.

Chart 33: Yearly increases in the prices of the most frequently purchased quality of rice in rural areas between June 2007 and June 2008 as reported by key informants (June 2007 = 100)

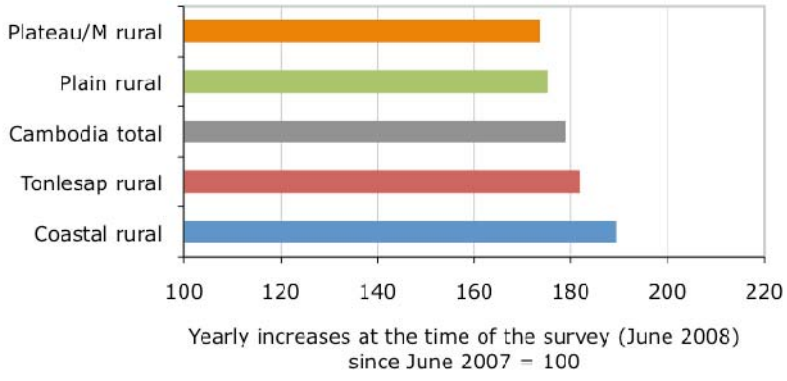
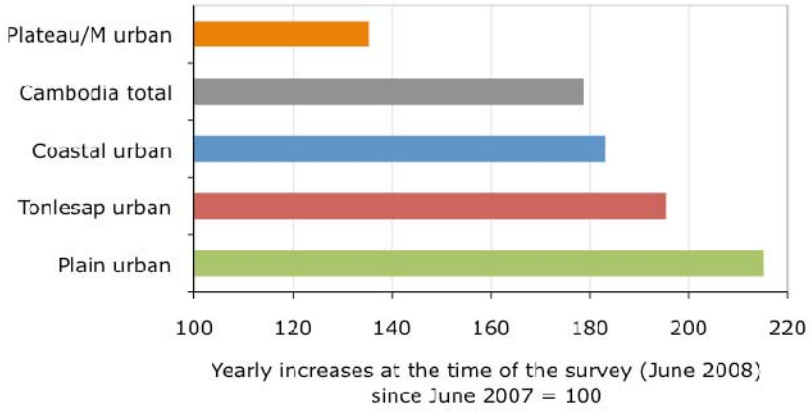
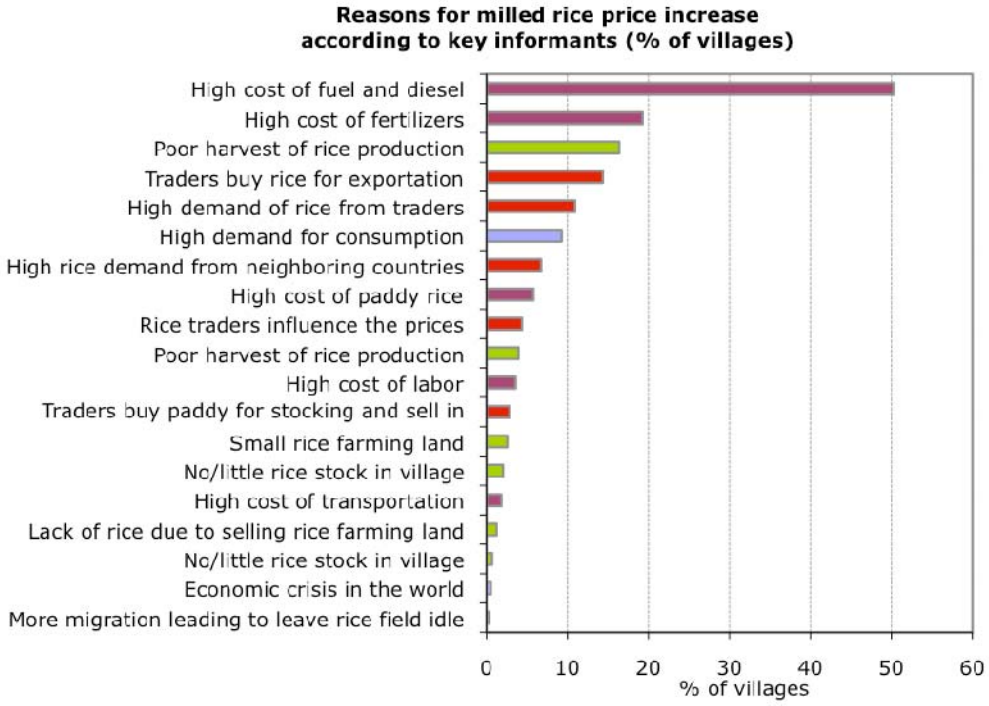


Chart 34: Yearly increases in the prices of the most frequently purchased quality of rice in urban areas between June 2007 and June 2008 as reported by key informants (June 2007 = 100)



The survey also gathered qualitative information on the main determinants of price changes through the VCL. According to key informants, the principal causes for the increase in the rice price were related to the increase in farming inputs (e.g. fuel, fertilizers, labor wages, and transportation costs). A second reason provided by the key informants pointed to market influences, including speculation by traders. Poor performance of rice production was indicated as the third principal reason (Chart 35).

Chart 35: Reported reasons for the increase in the prices of milled rice



The principal reasons were aggregated in broad categories with underlying similar causes[44]. It is noted that migration was the main determinant for the villages located in the Plains zone. This area is indeed the region where migration outflows are more intense. This suggests that the shortage of workforce to cultivate the rice fields was in this region an important component in determining the increase in the prices (likely because of decreased production). Constraints linked to the trading components were frequently reported in the villages of the Tonle Sap zone.

The earlier text analyzed both quantitative and qualitative information, as well as local perceptions of changes and main determinants for the increase in the prices of rice. The analysis could not gather conclusive evidence and quantify the impact of the food prices increases in 2008 against the variations of a normal year. This suggests that structural limitations likely played a significant role in determining the local increases as evidenced in the list of the main determinants (Chart 35).

For instance, the survey showed that the remoteness from the market was an important constraint for many of the villages. The difficulty to access the market likely influences both the price that villagers receive for sales and the price they pay to purchase in the market. Many villages reported that, when there is not a market outlet close to the village, they are obliged to sell their production to external buyers at lower prices than expected. In the Plateau/Mountain zone, there was a high prevalence of villages that cannot negotiate the best selling prices because of difficult access to market outlets and the consequent dependency on external buyers.

4.2 Activities and Income Sources

4.2.1 Opportunities of Cash Income in Rural and Urban Areas

Several variables in the household survey suggested that the rural economy in Cambodia is progressively diversifying from a traditional self-consumption system towards a more integrated market economy and dependency on cash income.

Table 13 shows the diverse types of cash income sources for household members in urban and rural zones. Wage labor (e.g. aggregated figures from agricultural labor, work in garment factories and in the construction sector), represented 35 percent of the reported income sources in the rural areas. The sale of own farming products was the second most important aggregated category (30 percent), followed by self-employment (23 percent).

The VCL further confirmed the household data and indicated that income source opportunities other than agriculture are common in most of the villages. For instance, opportunities to work in the construction sector were reported by more than 30 percent of the villages. In urban areas, the self-employment component was the most important source of income (44 percent), followed by salaried activities (from Government, NGOs, and private companies) and wage income sources (from agriculture, garment factories, and the construction sector) that were equally reported (21 percent) as the main opportunities of income.

[44] The VCL has investigated the reasons according to priorities expressed by key informants; to produce the overall summary weighting criteria have been applied.

Table 13: Percentage of households with at least one member earning a cash income by employment category and urban and rural strata

	Urban	Rural	Total
Self-employed	44%	23%	27%
Agricultural wage labor	1%	13%	11%
Sale of paddy	2%	11%	9%
Work in construction	6%	9%	8%
Other work for other	8%	8%	8%
Other agric. Product sale	2%	6%	5%
Garment factory wages	6%	5%	5%
Animal and animal product sales	2%	5%	4%
Income from fisheries	1%	4%	3%
Vegetables and fruits sales	3%	4%	4%
Gov, NGO, company	21%	4%	7%
Other	3%	3%	3%
Income from forests	--	3%	3%
Sale of handicrafts	1%	1%	1%
Remittances in country	1%	--	--

Key informants in the VCL indicated that in three out of four villages there are causal labor opportunities directly within the village. These opportunities were more frequently reported (85 percent of villages) in the Tonle Sap and Plains zones than in the other ecological zones.

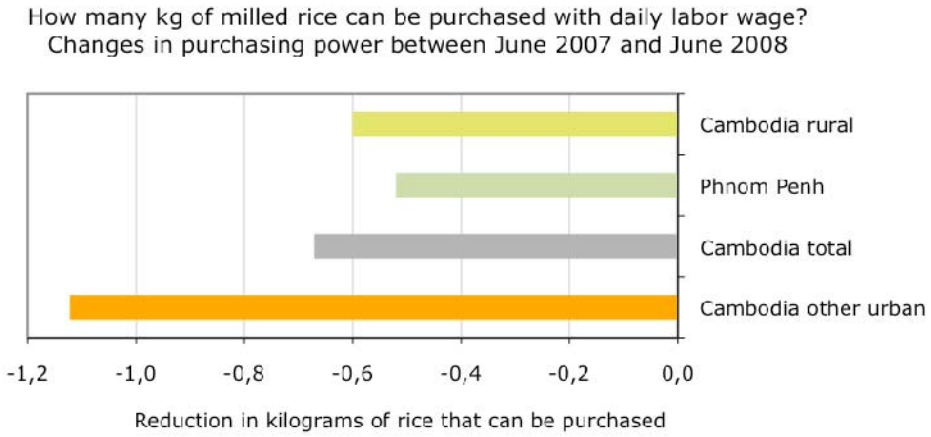
4.2.2 Terms of Trade (ToT) between Rice Price and Earning Increases

During 2008 rice prices increased drastically. During the same period, the earnings of the unskilled labor force (both in rural and urban areas) also increased. It is difficult to conclude whether the earning increases were sufficient to respond to the increases in the prices of rice. In this respect, the information provided by village key informants (VCL) on the daily earnings of agricultural laborers in rural areas (or of unskilled workers in urban areas) in June 2007 and 2008, was useful to analyze the impact of the food price increase.

Based on this information, the terms of trade (ToT) between the daily earnings of an unskilled laborer and the price of the most common type of rice was calculated. The ToT calculates the kilograms of rice that could be bought by a hypothetical standard sized household (five members) with a single cash income. The ToT indicator allows a comparison through time, and is useful for analyzing the changes in the access to food. As the majority of indicators, ToT is not without limitations. For instance, the interpretation of findings should take into account the fact that job opportunities are not the same in all areas, as the indicator assumes.

Chart 36 illustrates the reduction in the purchasing power of the households between June 2007 and June 2008 as derived from the analysis of ToT changes. With the exclusion of Phnom Penh, households in the urban areas of Cambodia experienced the worst deterioration of their purchasing power. In June 2008, a household living in these zones could buy approximately 1.1 kg less rice than in June 2007. This means the same household could afford to buy 4.6 kg of rice in June 2007 and only 3.5 kg in June 2008.

Chart 36: Terms of trade between milled rice and daily labor wage



ToT analysis disaggregated by ecological zone (Table 14) shows that urban households in the Plains zone could afford to buy nearly 2 kg of rice less in 2008 than in 2007 with daily unskilled wages (a 35.4 percent decrease). In rural areas, the Plains zone, along with the Coastal zone, experienced the greatest decrease in ToT (0.8 and 0.6 kg of rice respectively), while the Plateau/Mountain zone was the least affected amongst rural areas. Qualitative assessment made by key informants confirms that the rural areas of the Plateau/Mountain zone were least affected by the increase in food prices as observed earlier in the Chart 33.

The ToT indicator portrays a significant variability across ecological zones and across rural and urban areas. This suggests that many variables affect ToT outcomes. Further analysis will help to disentangle this complexity and to quantify the role of the diverse components.

Table 14: How many kg of milled rice can be purchased with daily labor wage?*

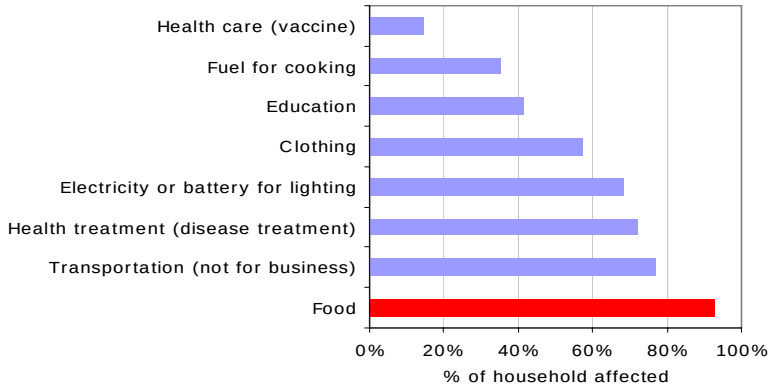
	kg less (June 2008 - June 2007)	% change (June 2008 – June 2008)
Phnom Penh	-0,5	-10,1
Plains total	-1,0	-17,6
Rural	-0,8	-15,0
Urban	-1,8	-35,4
Tonle Sap total	-0,5	-10,8
Rural	-0,4	-8,2
Urban	-1,1	-21,8
Plateau / Mountain total	-0,1	-1,8
Rural	-0,2	-3,5
Urban	0,3	16,1
Coastal total	-0,5	-10,7
Rural	-0,6	-12,5
Urban	-0,3	-5,0
Cambodia total	-0,7	-13,1
Rural total	-0,6	-11,3
Urban total**	-1,1	-23,0
Other urban***	-1,1	-24,3

*(ToT Earning/Milled rice price); **All urban areas including Phnom Penh; ***Urban areas excluding Phnom Penh. Source: Village Checklist, weighted figures

4.2.3 Change in Expenditures (December 2007 – June 2008)

Approximately 93 percent of the surveyed households increased their expenditure since December 2007. Chart 37 shows the percentage of households affected by the increase in diverse types of expenditures. The expenditure category that increased the most was food expenditure, followed by transportation, health, and electricity. Overall the highest increases in food expenditures were recorded in the urban areas.

Chart 37: Percentage of households affected by increasing expenditures



4.2.4 Debt and Credits

Many households in Cambodia are heavily indebted. The survey attempted to evaluate the level of indebtedness of the households and to understand the effect of the recent rice price increases on household debts. The underlying assumption is that exceptional price increases forced households to contract new debts.

As shown in Chart 38, rural areas are in general more indebted than urban ones (56 percent versus 43 percent, respectively). The Tonle Sap zone is the ecological zone most burdened by debts, and particularly by recent debts: four out of five indebted households contracted new debts since 2008. In the Plains zone the percentage of indebted households was also high, but the percentage of households with recent debts was significantly lower. The prevalence of indebted households is higher in the first and second quintiles of the Wealth Index (Chart 39). Overall, these quintiles also have the highest percentage of recent debts.

Chart 38: Percentage of households with debts and recent debts by location

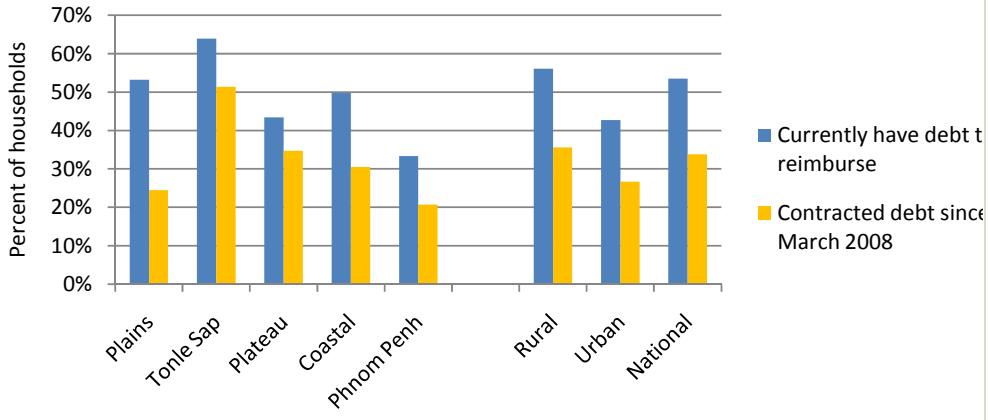
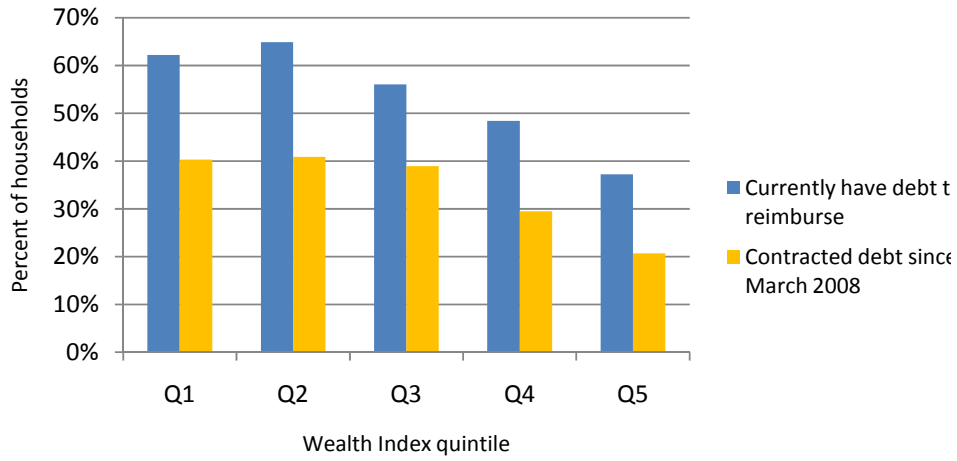


Chart 39: Percentage of households with debts and recent debts by Wealth Quintile



Households were requested to express their opinion on their capacity to repay the debts. The outcomes show that three out of five households do not expect to be able to pay off their debts in the next six months from the time of the survey. Table 15 below shows that a large majority of households in the Plains and Coastal zones declared that they do not know when they will be able to pay their debt.

Table 15: Percentage of households based on reported capacity to repay debts

	Long-undefined period	Short period
Plains	72%	28%
Coastal	64%	36%
Phnom Penh	54%	46%
Tonle Sap	49%	51%
Plateau	48%	52%
Total	60%	40%

The survey further explored the reasons for which households contracted new debts since March 2008. Chart 40 disaggregates the reported reasons by rural and urban areas. Contracting new debts to buy food represents approximately one-fourth of the responses. The response gathered a similar prevalence in the rural and urban areas. There is a high correlation of the prevalence of recent debts to buy food and the lowest quintiles of the Wealth Index (R^2=0.9944). In rural areas, new debts were also reported to cover health expenses and for agricultural input expenditures. This, however, has a seasonal component and should be interpreted as recurrent debt rather than linked directly to the increase in rice prices. Chart 40 indicates that households in urban areas increased their debts to expand entrepreneurial activities. The prevalence of these households increases from the first (poorest) to the fifth (richest) Wealth Index quintiles. On the contrary, the reasons 'To buy food' and 'To cover health expenses' were reported more frequently in the lower (poorer) Wealth Index quintiles (Chart 41).

Chart 40: Reasons for contracting new debts and credits after March 2008 by urban and rural areas

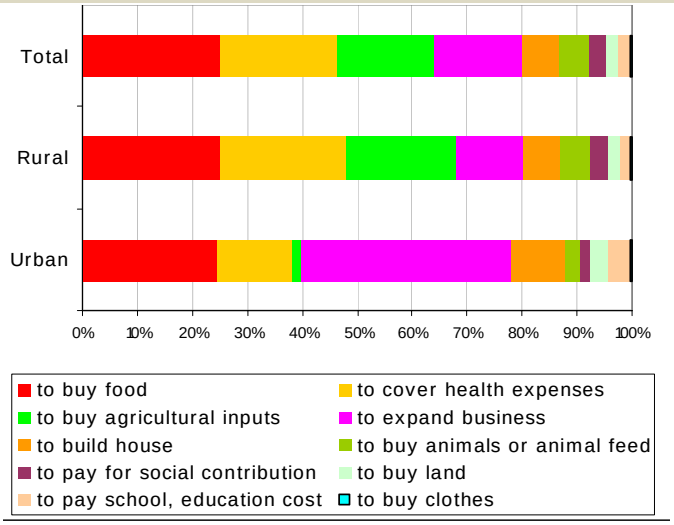
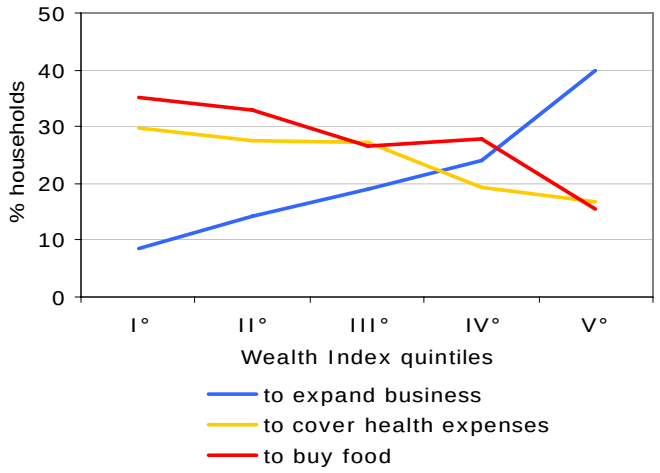


Chart 41: Percentage of households that contracted new debts after March 2008, by main reason and Wealth Index quintile



4.2.5 Livelihood Groups

CFSVA analyses typically collect the number and types of income activities in the surveyed households and investigate the corresponding livelihood profiles. However, due to both time and financial constraints, the 2008 survey instruments of the CFSVA in Cambodia were not designed to collect this information. Nonetheless, a different indicator was developed in the survey to generate livelihood groups and to analyze the impact that the diverse livelihood strategies have on food access and food security.

The responses of the variable 'Main source of cash income in the past month' were recoded into 8 categories as follows: agriculture, garment, construction, self-employed, casual labor, salaried, livestock and fishing, and other. Agriculture includes the cash-income opportunities that derive from the sale of agricultural products, wage employment in agriculture, and the sale of wild products. Farming activities take into account the cultivation of different crops and include those households that lease the land for cultivation.

In total, the analysis identified 16 livelihood groups. Table 16 below provides a detailed description of each group. It also explores some of the variables that help understand the characteristics of the diverse livelihood groups (e.g., urban versus rural setting; prevalence of migrated members and female-headed households; crop diversification; and distribution in the wealth quintiles). Some of these variables are typically associated with high levels of food insecurity. For instance, food insecurity often prevails in female-headed households. Information on migration and crop diversification provides some hints on the responsive capacity of the households, as both migration and crop diversification are often important livelihood strategies in response to stress.

Table 16: Livelihood groups

Livelihood groups	# HHs	% HHs	% rural	Description
Farmer & agriculture	622	27.9	97.3	This is the largest group of farm-holders. They primarily live in rural areas and mainly depend on own agricultural production as source of food. They have lower than average prevalence of migrated household members (15 percent) and female-headed households (17 percent). Nearly 14 percent of these households diversified their agricultural production from rice (e.g., permanent crops and cassava). Livestock is an important component of these livelihoods. Slightly less than 50 percent of these households are included in the lowest WI quintiles.
Farmer & self-employment	398	17.9	89.7	Migration is relatively uncommon in these households. The prevalence of female-headed households is lower than the national average (17 percent). Farming activities primarily concentrate on rice cultivation with the exception of a limited percentage of households who farms permanent crops. Livestock is an important component of these livelihoods. A relatively low proportion of these households belong to the poorest wealth quintiles.
Farmer & livestock and fish	97	4.4	95.9	This group is primarily located in rural areas. Nearly 20 percent of these households have at least one member that has migrated and works elsewhere. The prevalence of female-headed households is slightly lower than national average (19 percent). Livestock is a primary component of these livelihoods. Farming systems include maize but one-fourth of these households did not cultivate any land at the time of the survey. Approximately 40 percent of these households are in the poorest quintiles.
Farmer & construction	121	5.4	98.3	These households mostly depend on own production and employment in the construction sector. They have a very high prevalence of households with migrated family members (more than 50 percent) and lower than average percentage of female-headed households (16 percent). They cultivate rice almost exclusively. Livestock rising is a more important source of livelihood. Approximately 60 percent of them belong to the lowest wealth quintiles.
Farmer & casual labor	111	5.0	96.4	Cash income opportunities for this group mainly derive from casual labor. Approximately 25 percent of these households have a migrated member. Roughly 25 percent of these households are female-headed (higher than the national average). They cultivate only rice, while livestock is an essential component of their livelihoods. The group has one of the highest prevalence in the lowest WI quintile (37 percent).
Farmer & garment factory	70	3.1	97.1	Cash opportunities derive from employment in garment factories. More than half of these households have at least one household member who migrated. These households

				are headed by females more frequently than in the overall rural areas (approximately 23 percent). They cultivate only rice and livestock ownership is relatively uncommon. This group has one of the lowest prevalence of households in the poorest WI quintile (seven percent).
Farmer & others	81	3.6	96.3	This group includes households with cash income from pensions and remittances although farming activities are still important. Less than 15 percent of these households have migrated members. Nearly one-fourth of the households in this group (significantly higher than national average) are female-headed. These households cultivate only rice and livestock ownership is relatively less important than in other groups of farmers. 25 percent of these households belong to the poorest quintile.
Livestock and fish	37	1.7	86.5	This group is composed of both rural and urban households. Farming activities are negligible but livestock is an important livelihood component. The group has among the lowest proportion of households with migrated members (8 percent) and a low prevalence of female-headed households (10 percent). Nearly 60 percent of them were in the lowest WI quintiles.
Agriculture	81	3.6	81.5	This group includes households that sell their agricultural products or wild food, and agricultural workers. These households rarely own the land but they posses some livestock. The group has 22 percent (higher than national average) of households with migrated members and one of the highest prevalence of female-headed households (32 percent). The group has the highest proportion of households belonging to the poorest wealth quintile (nearly 50 percent).
Farmer & salaried	69	3.1	71.0	A large proportion of the households in this group live in urban areas. The group has a low prevalence of migrated household members (11 percent) and higher than average percentage of female-headed households (20 percent). More than 20 percent of the households in this group diversify their farming systems with permanent crops and most of them also have livestock-related income. More than 70 percent of these households are in the richest wealth quintiles.
Casual labor	50	2.2	70.0	This group is composed of rural and urban households. Casual labor such as occasional work in sectors different than agriculture, garment factories, and construction is the primary source of cash income. Migration is relatively common among these households (16 percent) and more than 26 percent of them are female-headed (higher than national average). They have one of the highest prevalence in the lowest wealth quintiles (nearly 70 percent).
Construction	51	2.3	66.7	This group is composed of rural and urban households working in the construction sector. They frequently raise small livestock and gather wild food. The group has the highest prevalence of migrated household members (37 percent) and one of the highest proportions of female-headed households (28 percent). Nearly 45 percent of these households are in the lowest wealth quintiles.
Garment factory	25	1.1	20.0	This group is mainly composed of urban households working in garment factories. One-fourth of these households have migrated members. The prevalence of female-headed households is the highest among the livelihood groups (48 percent). Roughly 40 percent of these households belong to the lowest wealth quintiles.

Self employment	285	12.8	36.1	This is a primarily urban group. Migration is relatively uncommon among these households (nearly 10 percent). The prevalence of female-headed households is instead among the highest (30 percent). Approximately 68 percent of these households belong to the wealthiest quintiles.
Salaried	96	4.3	18.8	This group represents four percent of households mostly located in urban areas. Less than 10 percent of these households have migrated members. The prevalence of female-headed households is 27 percent and higher than national average. They are among the better-off since more than 80 percent of these household belong to the highest wealth quintiles.
Others	35	1.6	57.1	Cash income for this group is derived by a mixed of income sources (e.g., pension, allowances, remittances, etc.). Overall they have 20 percent of households with migrated members and nearly 31 percent of the households female-headed. Approximately one-fourth of these households belong to the poorest quintiles.
Total	2229*	100		

*Relevant figures were missing for 6 surveyed households

Additional findings among livelihood groups include the following:

- With the exception of the livelihood group 'Others', the group 'Agriculture' had the highest prevalence (16 percent) of households with high dependency ratios.
- The 'Farmer & casual labor' and the 'Casual labor' groups have the highest prevalence of households that depend on a single member for cash earnings.
- Among farming groups, the 'Farmer & livestock and fish' and the 'Farmer & construction' groups had the lowest proportions of households with surplus production (36 percent and 39 percent, respectively). Surplus production was reported in 55 percent of households of the 'Farmer & garment factory' group.
- The 'Agriculture' and 'Garment factory' groups had the highest prevalence (44 percent and 40 percent, respectively) of households that contracted new debts since March 2008 in order to buy food.
- The 'Garment factory' and the 'Livestock and fish' had the highest proportion (60 percent and 54 percent, respectively) of households that reported that their income decreased in the six months preceding the survey.

SUMMARY OF CHAPTER 4

The CFSVA survey provided a wealth of information to understand the impact of food price increases. Both quantitative and qualitative information confirmed that urban areas outside Phnom Penh experienced the highest food price increases. The analysis also provided critical information to understand the variability of conditions experienced in different ecological zones. At the time of the survey, for example, the unskilled laborers in the rural areas of the Plains zone could afford nearly one kilogram of rice less compared to one year earlier. However, from the analysis of local perceptions and triangulation with quantitative data it was clear that the diverse impact of the price increases was determined by a number of different factors that could not be entirely addressed in this survey. Information in the next chapters will help to better understand the impact of food price increases for the food security of Cambodian households.

5. Household Food Consumption

Outline of the Chapter

The analyses of diet diversity and food consumption patterns are the core of the food security analysis. This chapter reports on the construction of the Food Consumption Score (FCS) and analyzes the characteristics of households in the three Food Consumption Groups: households with poor, borderline, and acceptable food consumption. This chapter also provides an estimate of the food insecurity conditions in the upcoming lean season.

5.1 Diet Diversity and Food Sources

5.1.1 Diet Diversity

National estimates indicate that rice and other cereals provide approximately 65 percent of daily caloric intake (up to 69 percent in rural Cambodia)[45]. Cambodians depend on fish for 70 percent of their protein intake. Fish are typically caught in rice paddies.

Data collection focused on the intake frequency of different food items (and asked households to recall food consumption of the previous week). Households then reported on how many days they consumed a given food from a list of food items. This information is a useful proxy indicator for diet composition. It provides good indication of the intake quality (poor or rich), and of intake composition (in terms of calories, proteins, and micronutrients).

Nutritionists divide foods into a number of food groups, of which a combination should be consumed on a daily basis to ensure a nutritionally adequate diet. Key food groups are cereals and tubers, pulses, meat and fish, vegetables, fruit, milk, sugar, oils and fats.

Cereals and Tubers

In this study, cereals and tubers include rice, maize, bread, cassava, sweet potato, potato and yam. Rice was the most common cereal, consumed seven days a week in all ecological zones. Other cereals and tubers are typically consumed less than one day a week in all reporting strata, except for Phnom Penh and urban households in the Plateau/Mountain zone, which consume bread more than one day a week. Overall, rural households consumed cereal and tubers more than urban households.

Pulses

Pulses (beans, groundnut and other pulses) are consumed, on average, less frequently than one day a week in all ecological zones. Only 16 percent of households reported eating beans over the seven-day recall period, without significant differences in rural and urban areas. The low weekly frequency of pulses consumption, combined with the high percentage of households who had not eaten any pulses at all, is an alarming signal of the scarcity of vegetable proteins in the diet. This has serious implications in ecological zones with relatively scarce access to animal proteins. A more detailed analysis shows that the highest percentage of households who had not eaten pulses during the last

[45] CSES, 2004. Page 21, Table 5.1 (Structure of Household Food Composition, 2004)

seven-days in rural households was in the Tonle Sap zone (90.4 percent)[46], followed by rural areas in Coastal zone (85 percent).

MEAT, FISH AND DAIRY PRODUCT

Meat and fish are important sources of animal protein. Access to meat and fish is of concern from the food security point of view. This study detects the frequency of consumption of animal protein and fat, which has not been studied in Cambodia before. The study used the following animal items: wild meat, beef, pork, chicken, fish and other aquatic animals.

The study found that rural household meat (beef, pork, and chicken) consumption is infrequent. They consume these products an average of once or twice a week. Urban households consume meat or fish an average of three days a week. The lowest frequency of meat consumption intake was found in rural areas in the Plateau zone, followed by rural Tonle Sap zone. Plain and Coastal zones appear a bit better off than the national average: 63 percent of households reported to have consumed meat at least once over the seven-day recall period.

Fish is an important component in the diet of rural households, particularly in poor households as they can freely catch them from lakes, ponds and rice paddies. Fish consumption was high, possibly because the survey was carried out during the fishing season. On average, fish was consumed four days a week. Approximately 87 percent of surveyed households reported to have eaten fish at least once over the seven-day recall period. The highest percentage of households who did not consume fish was found in the rural areas (13 percent) and in Phnom Penh (14 percent). Rural and urban households of the Plateau/Mountain zone had the highest percentage of households who did not consume fish during the week before the survey (19 percent and 27 percent, respectively). The Tonle Sap zone had the highest differences between rural and urban areas (16 percent and 6.7 percent, respectively). Rural Coastal and Plains zones had better consumption than the national rural average. Frogs and crabs, which are caught in rice paddies, are another important component in the diet of rural households. On average, 35 percent of the surveyed households reported to have eaten these aquatic animals over the seven-day recall period.

On average, the surveyed households consumed wild meat less than one day a week. Milk is mostly consumed in urban areas. Overall, only 13 percent of sampled households reported to have consumed milk over the seven-day recall period.

VEGETABLE AND FRUIT

Vegetables include green leafy vegetables, shoots/mushrooms, and other vegetables. With the exception of rice, vegetables are the most frequently consumed food group. They are consumed on average six days a week. The study found that 97 percent of households reported to have consumed vegetables at least once over the seven-day recall period. In the contrary, fruits are consumed only twice a week, on average. The study found that only 52 percent of households reported to have eaten fruit at least once over the seven-day recall period. This may have implications in terms of access to important sources of vitamins and micronutrients.

[46] As a confirmation of the concerns about the scarce use of vegetable proteins, Tonle Sap is also – see next paragraph - one of the ecological zones with the highest percentage of households who never ate animal proteins during the last week.

OILS, FATS AND SUGAR

Vegetable oil and animal fats are primarily used for cooking. Oils are consumed on average four days a week. The study found that 90 percent of households reported to have consumed oil at least once over the seven-day recall period. Sugar was consumed on average twice a week. Nearly 64 percent of households had consumed sugar at least once over the seven-day recall period.

Table 17 summarizes the above information by ecological zone and urban versus rural strata, and reports on the average weekly household food consumption using the above food groups.

Table 17: Frequency of food consumption (during 7-day recall period)

Food Groups	Food Items	Plains		Tonle Sap		Plateau		Coastal		Cambodia			
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Phnom Penh	Urban	Rural	Cambodia
Cereal and Tubers	Rice	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	Maize	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.2	0.2
	Bread	0.7	0.2	0.8	0.2	1.2	0.1	0.6	0.6	1.2	0.8	0.2	0.4
	Cassava/yam	0.1	0.1	0.2	0.1	0.1	0.5	0.0	0.4	0.3	0.1	0.2	0.2
	Sweet potato/potato	0.1	0.1	0.5	0.1	0.1	0.6	0.1	0.3	0.5	0.3	0.2	0.2
Pulses	Bean/groundnut/ other pulse	0.4	0.4	0.2	0.2	0.8	0.5	0.2	0.4	0.6	0.3	0.3	0.4
Meat and Fish	Fish	4.2	4.6	4.2	3.5	2.7	3.1	4.6	4.8	3.6	4.2	4.1	4.1
	Other aquatic animals (frogs, crabs, etc)	0.2	1.0	0.4	1.1	0.5	2.0	0.7	1.6	0.4	0.3	1.2	1.0
	Meat (beef, pork, chicken)	2.7	1.6	3.1	1.4	2.2	1.2	2.7	1.8	3.5	2.9	1.5	1.8
	Wild meat	0.0	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.1	0.1
	Eggs	1.6	1.4	2.1	1.5	3.0	1.3	2.6	2.1	2.9	2.0	1.5	1.7
Vegetables	Vegetables	5.8	5.9	6.0	5.4	6.2	5.4	6.2	5.6	6.0	6.0	5.6	5.7
Fruits	Fruit	2.4	1.2	2.6	0.9	2.8	1.0	2.3	2.0	3.1	2.5	1.2	1.5
Sugar & Sweets	Sugar & sweets	2.2	2.8	2.6	1.4	2.6	1.6	2.2	2.4	1.9	2.4	2.2	2.2
Oils/fats	Vegetable oil or animal fat	4.9	4.2	4.5	3.6	5.0	3.6	5.6	5.2	3.9	4.8	4.0	4.1
Milk	Milk products	0.9	0.3	1.1	0.1	0.6	0.3	1.2	0.7	1.7	1.0	0.2	0.4
Condiments	Prohok	3.5	4.3	2.3	3.5	3.1	4.4	3.0	1.2	3.3	2.9	3.9	3.7
	Soy sauce, fish sauce, etc.	5.8	5.7	2.6	3.6	5.4	4.1	6.6	6.5	5.5	4.4	4.9	4.9

*Condiment consumption was not included in analysis

5.1.2 Rice Consumption per Capita

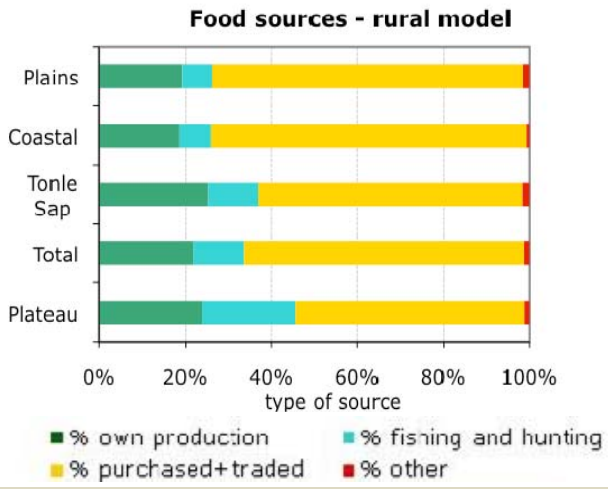
The survey gathered useful information to estimate the daily per capita consumption of rice. The HHQ survey asked 'How much milled rice do you need for one month consumption (including own rice)?'. Findings showed that the median daily per capita consumption of rice[47] is not far from levels considered adequate in Cambodia (about 450 grams/day/per capita). Nonetheless, the above median figure hides significant differences between urban and rural areas and between ecological zones. The per capita consumption of rice was significantly lower ($p<0.001$) in urban areas (9.5 kg of rice on a monthly basis) than in rural ones (nearly 13 kg of rice per capita per month). This is likely due to a more diversified consumption of cereals in urban zones. For instance, urban households have a higher consumption of bread. However, in the urban Plateau/Mountains and in the rural Coastal zones the frequent consumption of bread might be associated with the reduced availability of local rice.

5.1.3 Sources of Food

The analysis of food sources illustrated a detailed picture of market dependency by ecological zone and by urban and rural strata. The principal food sources are from 1) own production, 2) purchase and, 3) fishing and hunting; other sources only had a marginal role.

Rural households (Chart 42) are characterized by a higher dependency on own production than urban households. 'Fishing, hunting and gathering' also play a significant role as sources of food for rural households, particularly in the Plateau/Mountain and Tonle Sap zones.

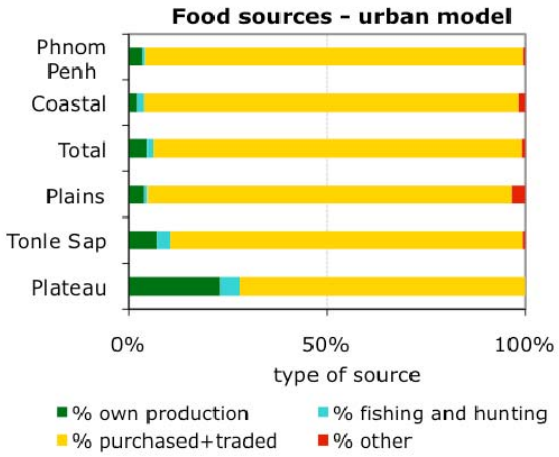
Chart 42: Food sources for rural households



Urban households primarily depend on the market for food (Chart 43). Phnom Penh had the highest dependency on the market, followed by the Coastal zone. Market dependency for urban households is lowest in the Plateau/Mountains zone.

[47] Our estimation uses a very simple weighting factor, counting as half any household component with age under six.

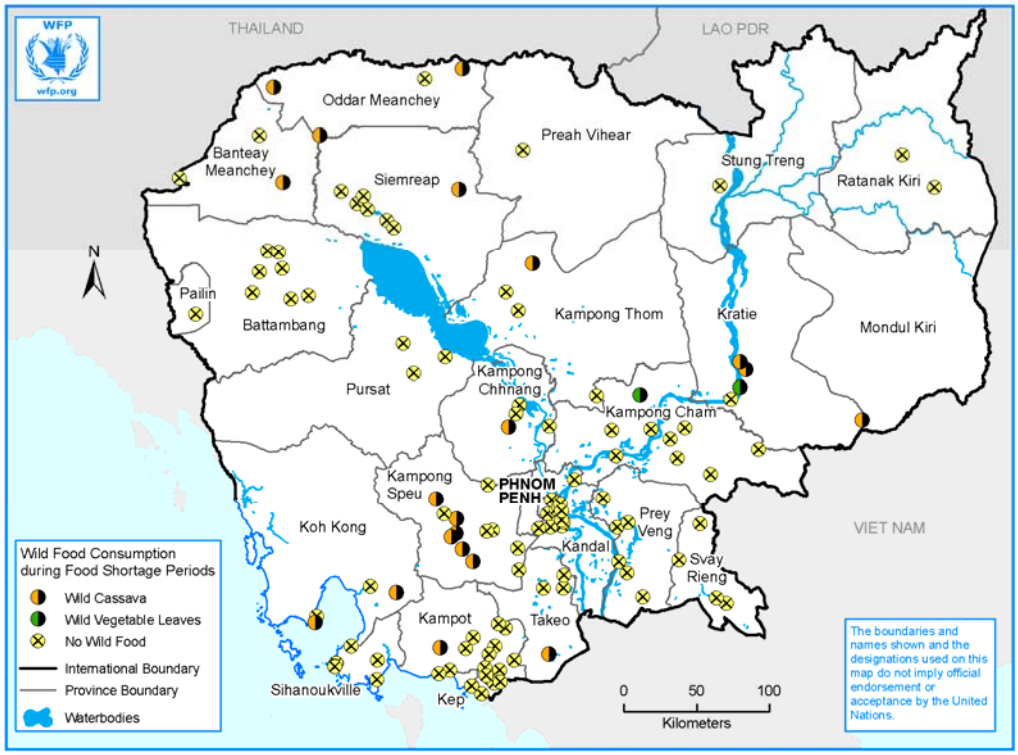
Chart 43: Food sources for urban households



Box 4: Wild Food

Cambodian households in remote areas frequently rely on the forest not only for timber, but for a large set of non-timber products, including wild foods during the lean season. The forests provide important sources of animal proteins from wild animals and fodder for domestic animals. Using the VCL it was possible to identify villages where two types of vegetables are frequently collected 'in case of food shortage': wild cassava and wild vegetable leaves. Map 6 displays the results.

Map 6: Wild food consumption during food shortage periods, by prevalent type



5.2 Food Consumption Score and Food Consumption Groups

5.2.1 Household Food Consumption Score

Several studies confirmed that there is a significant correlation between dietary diversity and nutritional adequacy, women and women's anthropometry, and socio-economic status[48]. WFP has built on previous work done on dietary diversity to customize a tool – the Food Consumption Score – that captures the variability among households of diverse consumption patterns. The Food Consumption Score (FCS) is calculated by the frequency of consumption (number of days per week) of different food groups consumed by a household during the seven days prior to the survey. To develop the FCS, diverse food items are reorganized into a limited number of food groups. Consumption frequencies of food items belonging to the same group were summed. Frequencies with the same food group that are higher than seven, are recoded as seven. The value obtained for each food group is then multiplied by a specific weight, reflecting its nutrient density, so that the final food consumption score is the sum of the weighed food groups. Table 18 below illustrates collected food items, food groups and their relative weights.

Table 18: Collected food items, food groups and their relative weights

Food Items	Food Groups	Weight
Rice, bread, maize	Cereals and Tubers	2
Cassava, sweet potato/potato/yam		
Pulses (including beans, groundnuts, etc.)	Beans	3
Vegetables (including green, leafy vegetables, bamboo shoots and mushrooms, etc.)	Vegetables	1
Fruits	Fruit	1
Wild meat, fish and other aquatic animals, domestic meat (poultry, pork, chicken), eggs	Meat and fish	4
Milk / milk products	Milk	4
Sugar	Sugar	0.5
Oils, fats	Oil	0.5

5.2.2. Household Food Consumption Groups

Three standard thresholds in the values of the FCS have been identified to distinguish different food consumption levels. A score of 21 was set as bare minimum: this value typically derives from a daily consumption of the staple food and vegetables. Households with a score lower than 21 do not have the minimum daily consumption of staple and vegetables. They are therefore considered to belong to the 'poor food consumption' group. The second threshold was set at 35, composed by daily consumption of the staple and vegetables complemented by a frequent (e.g., four days/week) consumption of oil and pulses. Households with a food consumption score ranging between 21 and 35 are defined as the 'borderline food consumption' group. Households that score above 35 are estimated to fall in the 'acceptable food consumption' group.

The scores have been elevated to take into account the fact that oil is consumed on average four-five days a week[49]. This increased the poor and borderline thresholds to 24.5 and 38.5, respectively.

[48] Ruel M., 2003, Operationalizing dietary diversity: a review of measurement issues and research priorities. Journal of Nutrition 133:3922S-3926S.

[49] To account for this, minimum cut-off points with high oil/fat were augmented by 3.5 points ([7*weight of oil] = 7*0.5=3.5).

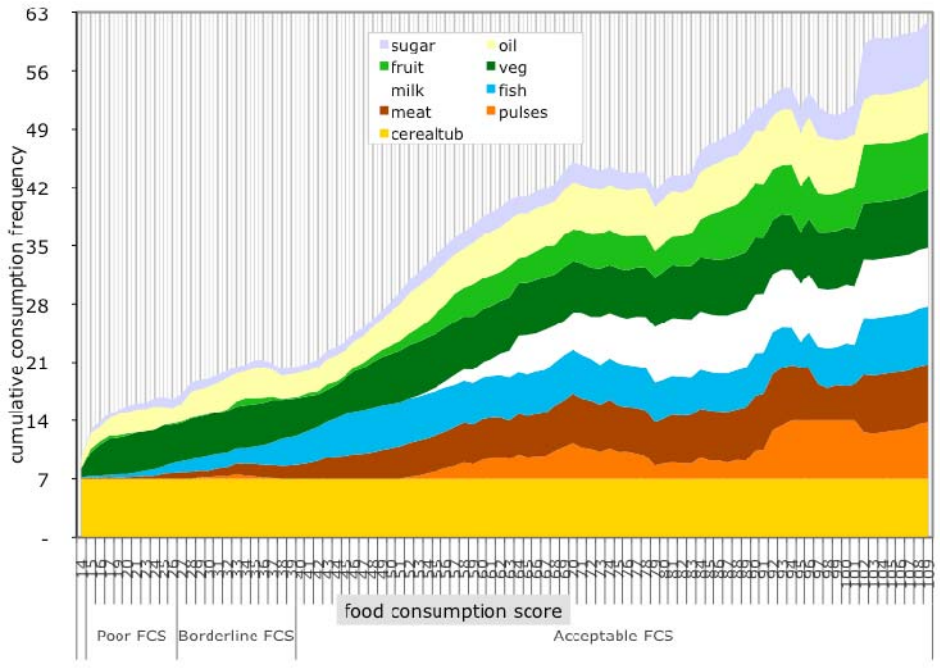
Table 19 below shows the standard and retained thresholds of the Food Consumption Score and the distribution of the surveyed households across the three Food Consumption Groups. Based on these thresholds, nearly 11 percent of the households included in the survey had poor and borderline food consumption.

Table 19: Thresholds of Food Consumption Score (FCS) and percentage of Food Consumption Groups

Food Consumption Groups	Standard Cut-off	Cambodia Cut-off	% of HHs
Poor Food Consumption	0-21	0-24.5	4.1%
Borderline Food Consumption	21.5-35	25- 38.5	7.0%
Acceptable Food Consumption	> 35	> 38.5	88.9%

Chart 44 below shows the consumption (expressed as average number of days) of the different food groups by the FCS. The '24.5' and '38.5' thresholds are represented as the limits between those with a poor, borderline and acceptable FCS. Cereals and tubers (mainly rice) supplemented with vegetables and vegetable oil are the basis of household diets across the three food consumption groups. Increases in the FCS are noticeably associated with a rapid increase in the weekly consumption of fish. A FCS of 38.5 is associated with the daily consumption of animal protein (fish or meat). It is only when the consumption of meat and fish reaches six days a week that the consumption of the other food items, i.e., milk, fruits, and pulses, become evident.

Chart 44: Food Consumption Score



Poor Food Consumption

Households with poor FCS represent four percent of households. These households are highly food insecure**.** This group is composed of households that rarely, if at all, consume any animal products and pulses. Rice is consumed on a daily basis. Vegetables are consumed two or three days a week. This low diet diversity is likely associated with micronutrient deficiencies, especially among children.

BORDERLINE FOOD CONSUMPTION

More than seven percent of the surveyed households had a 'borderline' FCS. Households belonging to this group are defined as moderately food insecure. These households consume fish more frequently and, therefore, have a relatively better protein intake than households in the poor food consumption group.

ACCEPTABLE FOOD CONSUMPTION

Households with acceptable FCS represent 89 percent of the total. These households are considered to have acceptable food consumption consisting of sufficient dietary diversity for a healthy life. The consumption of animal protein, mostly meat, is the main difference with the poor and the borderline food consumption groups.

5.2.3 FOOD CONSUMPTION PATTERNS

A cluster analysis was further developed that grouped the surveyed households in a limited number of clusters. Households in these clusters have similar patterns of food frequency intake and comparable ways to combine the diverse food groups during the week. These clusters were then compared with the thresholds applied for the poor, borderline and acceptable food consumption groups. Clusters are good proxy indicators of the diverse dietary compositions. However, a possible bias in the cluster analysis might be due to the fact that data was collected during the fishing season. Fish consumption might then be higher than in other moments of the year.

The analysis identified seven diverse food consumption patterns. Each cluster was named according to the composition of the dietary profile. Table 20 provides an overview of their characteristics. In the table, the clusters are ordered from those with poor quality and less balanced intake to clusters with rich quality and more balanced intake. The frequencies higher than the Cambodia average are highlighted in green; those lower than national average are highlighted in red; national averages are highlighted in yellow.

The poorest patterns of consumption (CL 1 and 2) consume cereals and tubers every day of the week but have a less frequent consumption of other food products. The first cluster includes a frequent consumption of vegetables whereas the households in the second cluster consume vegetables less frequently but have a more frequent intake (at least three days a week) of fish. Overall the two patterns with poor and scarce quality intake capture the totality of the households in the poor food consumption group and more than 90 percent of the households in the borderline food consumption group. The other patterns were distributed in the acceptable food consumption group, with the patterns with daily consumption of meat or fish more frequently represented. These findings suggest that the food consumption groups and consumption patterns are consistent.

Table 20: Clusters of food consumption patterns

Cluster profiles	% HH	Cereals tubers	Pulses	Meat	Fish	Veg.	Oil	Milk	Sugar	Fruit
CL1= Poor quality intake	14	7.0	0.0	2.3	1.6	6.1	3.4	0.0	1.0	0.0
CL2 = Scarce quality intake	13.8	7.0	0.0	2.0	3.6	2.1	2.6	0.0	1.0	1.0
CL3 = Fish protein	19.1	7.0	0.0	1.8	6.1	6.3	2.1	0.0	1.0	1.0
CL4 = Daily fish and less meat	30.5	7.0	1.0	3.5	6.0	6.4	6.0	0.0	2.0	1.0
CL5 = Daily meat and less fish	14.8	7.0	1.0	5.8	3.7	6.3	4.1	1.0	1.0	3.0
CL6 = All proteins + pulses	3.3	7.0	7.0	5.0	5.6	6.2	5.4	2.0	2.0	3.0
CL7 = All protein + milk	4.5	7.0	2.0	5.3	4.8	6.1	5.3	7.0	2.0	4.0
Total	100	7.0	1.0	3.3	4.7	5.7	4.1	1.0	2.0	1.0

5.2.4 Geographical Distribution of the Food Consumption Groups

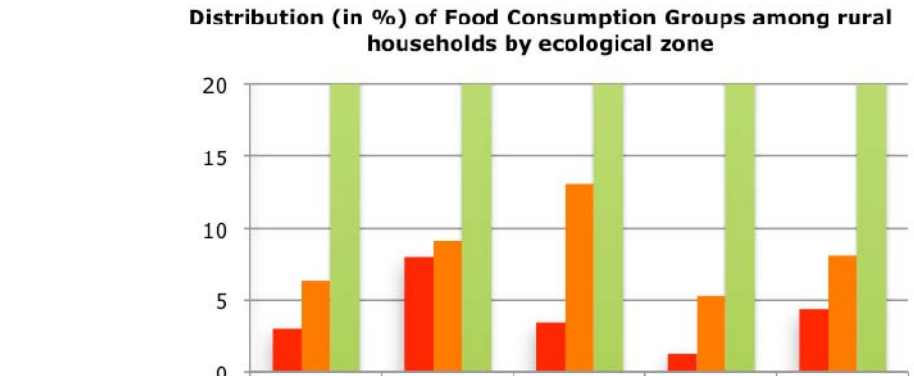
Charts 45 and 46 below show the geographic distribution Food Consumption Groups (FCGs) by rural and urban strata and by ecological zone.[50]

Among the rural households, the Tonle Sap and Plateau/Mountain zones have the highest prevalence of households with poor and borderline food consumption. The food insecure categories (poor and borderline), account for nearly 17 percent of the surveyed households in the two ecological zones. However, the Plateau/Mountain zone has a lower percentage of poor food consumption households. These two zones also have the highest cumulated percentages (approximately 35 percent in both cases) of households with poor and scarce food intake (Clusters 1 and 2 of food consumption patterns).

Overall, the food insecure categories are less represented in urban areas than in rural areas. Rural households have poorer quality and less balanced food intakes than urban ones. The highest values of poor and borderline food insecure are found in the urban households of the Plateau/Mountain zone while Phnom Penh has the lowest percentage of food insecure.

Urban and rural differences are significant. The Plains zone has approximately nine percent of food insecure households. For the rural areas in the Plain zone, food insecurity is less extreme (e.g. more borderline than poor consumption). This is likely due to more frequent consumption of fish than in urban areas. As for urban areas of the same Plains zone, food insecurity is extreme – characterized primarily by poor consumption households. Urban households in the Coastal zone show lower prevalence of food insecure categories compared to the urban households of the same zone.

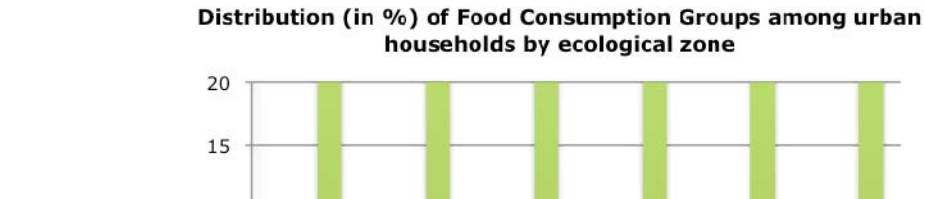
Chart 45: Frequency of FCGs by rural stratum and ecological zone



	Plains	Tonle Sap	Plateau/ Mountain	Coastal	Cambodia
Poor consumption	3	8	3,5	1,3	4,4
Borderline Consumption	6,4	9,1	13,1	5,3	8,1
Acceptable consumption	90,6	82,9	83,5	93,3	87,5

[50] To facilitate the reading of the differences across the zones, the scale of the charts focuses on the values between 0 and 20%.

Chart 46: Frequency of FCGs by urban stratum and ecological zone

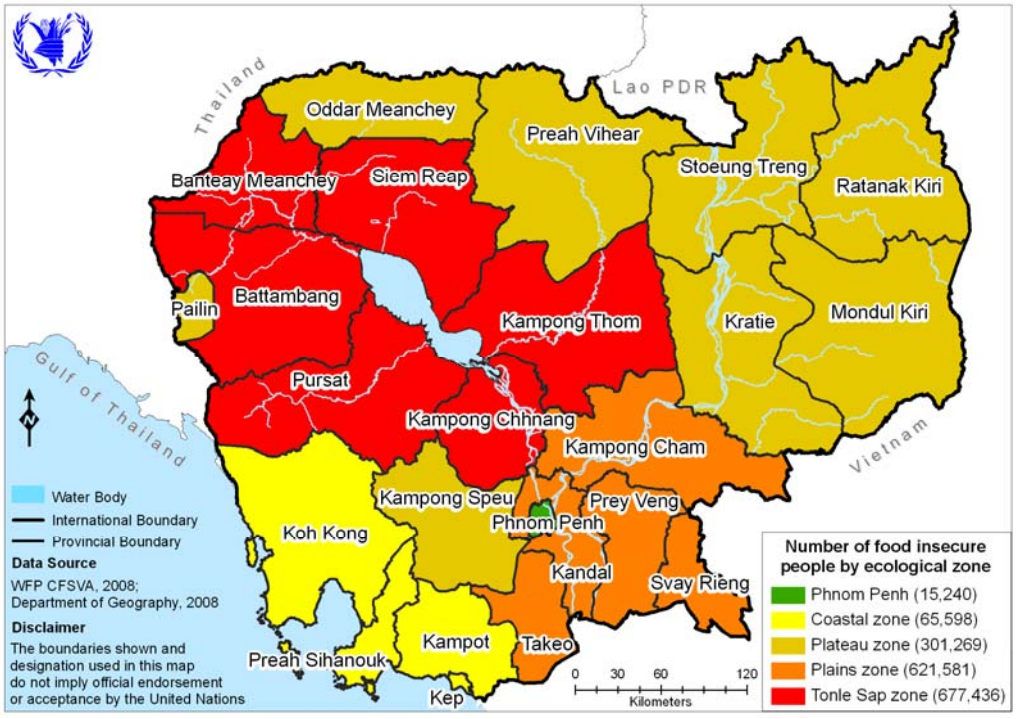


	Phnom Penh	Plains	Tonle Sap	Plateau/ Mountain	Coastal	Cambodia
Poor consumption	0,2	8,9	2,2	3,3	1,1	2,9
Borderline Consumption	1,2	0	5,6	6,7	3,3	2,5
Acceptable consumption	98,6	91,1	92,2	90	95,6	94,5

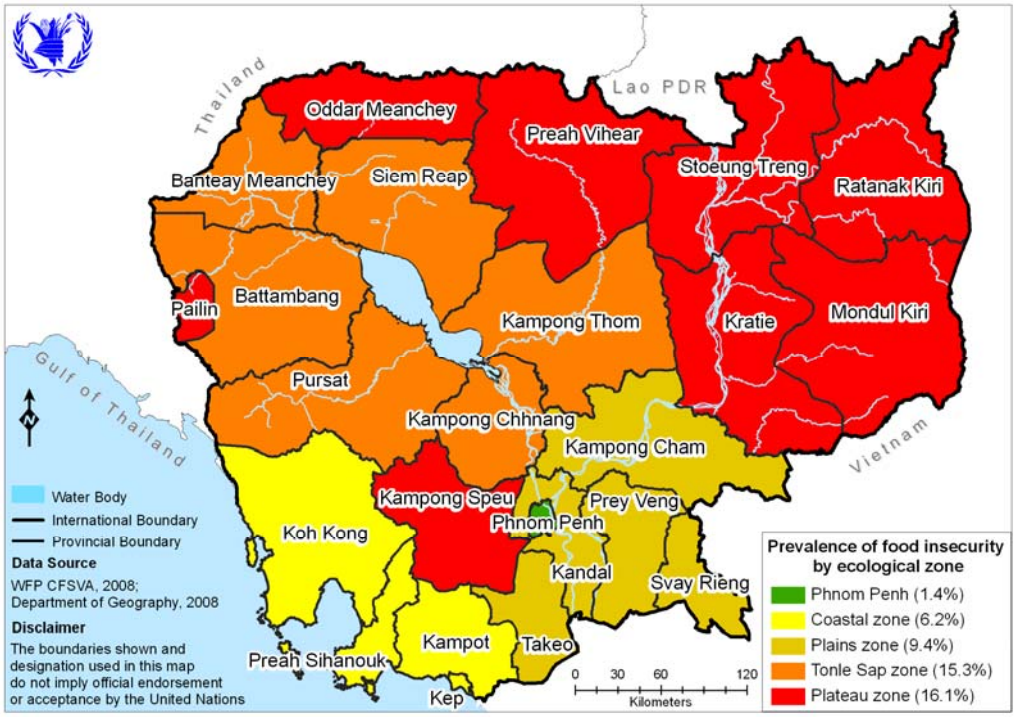
Map 7 shows the geographic distribution of the total number of food insecure people in Cambodia by ecological zone: approximately 680,000 people in the Tonle Sap zone were classified as food insecure, as were 620,000 in the Plains zone, 300,000 in the Plateau/Mountains zone, 66,000 in the Coastal zone and 15,000 in Phnom Penh.

Map 8 shows the prevalence of food insecurity in Cambodia by ecological zone. At 16.1 percent the highest prevalence is in the Plateau zone, followed by 15.3 percent in the Tonle Sap zone, 9.4 percent in the Plains zone, 6.2 percent in the Coastal zone and 1.4 percent in Phnom Penh.

Map 7: Geographic distribution of food insecure people in Cambodia by ecological zone



Map 8: Prevalence of food insecurity in Cambodia by ecological zone



5.2.5 Food Consumption and Livelihood Group

The highest prevalence of poor food consumption households was found in the 'Construction' (eight percent), 'Farmer & Other' (7.4 percent), 'Agriculture,' and 'Casual labor' livelihood groups (6.1 percent and six percent, respectively). The highest proportions of households with borderline food consumption were found in the 'Farmer & Other' (17.3 percent), 'Casual labor' (12 percent), 'Farmer & construction' (11.7 percent) and 'Farmer & Casual labor' (11.6 percent) groups.

Overall, the highest prevalence of food insecure households was in the following groups: 'Farmer & Other' (24.7 percent), 'Casual labor' (18 percent), 'Farmer & Construction' (17.4 percent), and 'Farmer & Casual labor' groups (14.3 percent). These findings suggest that the construction and the casual labor livelihood groups have the high proportion of households that are food insecure.

Table 21 shows the distribution of FCGs among the livelihood profiles. Three livelihood profiles – the 'Salaried', 'Self employment', and 'Farmer & Salaried' – have higher than average FCS values. More than 70 percent of the households in these livelihood profiles belong to the wealthiest quintiles. These three groups were then used as reference to compute the difference (expressed as statistical significance) from the other livelihood groups. Table 21 thus reports when the other livelihood groups differ statistically from the reference groups. It is notable that households relying solely on agriculture ('Farmer and agriculture', 'Farmers and other', and 'Agriculture') have a lower FCS compared with the other four livelihood activities.

Based on this analysis, the following groups have statistically significant lower FCS values (highlighted in light orange) compare to the three better-off livelihood groups: 'Farmer & agriculture'; 'Farmer & construction'; 'Farmer & casual labor'; 'Farmer & Other'; 'Agriculture'; and 'Casual labor'.

Table 21: Livelihood profiles and food consumption

		Food Consumption Groups			* Statistically different (sign=0.05) from better-off livelihood groups		
Livelihood profile	% of sample	Poor	Borderline	Mean FCS	**a)**	**b)**	**c)**
Farmer & agriculture	27.9	5%	9%	49	*	*	*
Farmer & garment factory	3.2	3%	1%	54	*		
Farmer & construction	5.4	5%	12%	50	*	*	*
Farmer & self employment	17.8	3%	7%	53	*		*
Farmer & casual labor	5	3%	11%	50	*	*	*
Farmer & salaried	3.1	2%	5%	58			
Farmer & livestock and fish	4.3	4%	5%	51	*	*	*
Farmer & others	3.6	8%	17%	48	*	*	*
Agriculture	3.6	6%	5%	50	*	*	*
Garment factory	1.1	0%	4%	55			
Construction	2.3	8%	2%	53	*		
Self employment	12.7	4%	1%	57			
Casual labor	2.2	6%	11%	49	*		*
Salaried	4.3	2%	6%	62			
Livestock and fish	1.6	1%	1%	55			
Others	1.6	4%	2%	55			
National average		4%	7%	53			

Better-off livelihood groups: a) Salaried; b) Farmer & salaried; c) Self employment;

5.2.6 Other characteristics of Food Consumption Groups

Bi-variate statistics were computed to further investigate the characteristics of the food consumption groups. Only significant relationships have been reported below.

- There is a higher prevalence of female-headed households (nearly 30 percent) among the households with borderline food consumption than in the poor and acceptable food consumption groups (20 percent and 22 percent, respectively).
- Households with a single member engaged in cash-income activity are significantly more likely to be food insecure. Approximately 43 percent of the households in the poor food consumption groups have only one member with cash earnings (as opposed to less than 30 percent in the acceptable group).
- Households with poor and borderline food consumption contracted new debts in the months preceding the survey more frequently than households with acceptable food consumption. Nearly 50 percent of households with poor food consumption contracted a new debt after March 2008 (as opposed to 32 percent in the acceptable food consumption group).
- Households with a high dependency ratio are more likely to be in the poor and borderline food consumption groups. For instance, the proportion of households with a dependency ratio higher than 0.6 is 12 percent and nine percent in the poor and borderline food consumption groups respectively, as opposed to the acceptable food consumption group where the prevalence was six percent.
- The survey found a highly significant relationship between food consumption scores and the Wealth Index. There is a higher prevalence of households with poor food consumption in the lowest quintiles (68 percent) compared to households with acceptable food consumption (37 percent). The value of land and livestock is significantly higher for households with acceptable food

consumption (on average more than 10,400 *riels*) than for the food insecure households (6,440 *riels* on average for the poor and borderline food consumption groups).

5.3 Scenario of Food Insecurity Status during the next Lean Period

The proportion of 'food insecure' people might significantly increase during the peak of the next lean season (from August-November 2008) and at the end of the fishing season. Data collection was done in June 2008 during the fish season. Hence, it is likely that fish consumption was higher than other periods of the year. To account for this seasonal component and build a likely scenario for the lean season, the thresholds used to calculate the FCS were augmented by 10 points[51]. The new thresholds were then 0-31 for the poor food consumption group; 31.5 to 45 for the borderline food consumption group and higher than 45 for the acceptable food consumption group.

With these values a more alarming scenario of food insecurity might be expected for the next lean season (Table 22 and Table 23). The scenario indicates that during the non-fishing season, the percentage of households with poor food consumption could rise to nearly seven percent, the proportion of households with borderline food consumption could increase to 11.5 percent, and the percentage of households with acceptable food consumption might decrease to slightly less than 82 percent.

The findings suggest that, in the next lean season, more than half a million households or nearly 2.8 million individuals will be food insecure. The highest increment is estimated in Phnom Penh, where the percentage of food insecure is expected to increase more than four times (from 1.4 percent to 5.7 percent) from June 2008 to the period of the next lean season (August-November 2008). The proportion might increase from nine percent to 16 percent in the Plains ecological zone; from 15 percent to 23 percent in the Tonle Sap zone; from 16 percent to 26 percent in the Plateau/Mountain ecological zone; and might double (from six percent to 12 percent) in the Coastal zone.

Table 22: Expected percentage of food insecure households during the next lean season (August-November 2008)

Ecological zone	Stratum	Poor Food Consumption	Borderline Food Consumption	Acceptable Food Consumption
Plains	Rural	5.7	10.9	83.4
	Urban	8.9	2.2	88.9
	Total	**6.0**	**10.0**	**84.0**
Tonle Sap	Rural	11.7	14.7	73.6
	Urban	3.3	4.4	92.2
	Total	**10.1**	**12.7**	**77.2**
Plateau / Mountain	Rural	7.4	19.8	72.8
	Urban	10.0	3.3	86.7
	Total	**7.6**	**18.6**	**73.8**
Coastal	Rural	2.9	9.6	87.5
	Urban	2.2	10.0	87.8
	Total	**2.8**	**9.7**	**87.5**
Phnom Penh	Urban	0.7	5.0	94.3
	Total	**0.7**	**5.0**	**94.3**
Cambodia	Rural	7.5	13.2	79.3
	Urban	3.8	4.5	91.7
	National	**6.8%**	**11.5%**	**81.7%**

*Calculations are made using weights for current urban and rural population

[51] Considering that the week consumption of fish at the time of the survey was 2.5 times higher than other periods (2.5 times by 4 = 10 FCS).

Table 23: Distribution of food insecure people/households (June 2008) and during the next lean season (August-November 2008) by ecological zone

Ecological zone	Stratum	Currently food insecure (June 2008)*			Potentially food insecure during the lean season (August-November 2008)*		
		# people	# HHs	%	# people	# HHs	%
Plains	Rural	564,972	112,994	9.4	986,948	197,390	16.6
	Urban	56,609	11,322	8.9	70,541	14,108	11.1
	Total	**621,581**	**124,316**	**9.4**	**1,057,489**	**211,498**	**16.0**
Tonle Sap	Rural	613,385	122,677	17.1	959,205	191,841	26.4
	Urban	64,050	12,810	7.8	63,947	12,789	7.8
	Total	**677,436**	**135,487**	**15.3**	**1,023,152**	**204,630**	**22.8**
Plateau/ Mountains	Rural	289,203	57,841	16.5	461,188	92,238	27.2
	Urban	12,066	2,413	10.0	16,052	3,210	13.3
	Total	**301,269**	**60,254**	**16.1**	**477,240**	**95,448**	**26.2**
Coastal	Rural	57,132	11,426	6.7	103,523	20,705	12.5
	Urban	8,466	1,693	4.4	25,349	5,070	12.2
	Total	**65,598**	**13,120**	**6.2**	**128,872**	**25,774**	**12.5**
Phnom Penh	Urban	15,240	3,048	1.4	63,392	12,678	5.7
	Total	**15,240**	**3,048**	**1.4**	**63,392**	**12,678**	**5.7**
Cambodia	Rural	1,524,693	304,939	12.5	2,510,864	502,173	20.7
	Urban	156,431	31,286	5.5	239,282	47,856	8.3
	National	**1,681,124**	**336,225**	**11.1**	**2,750,146**	**550,029**	**18.3**

SUMMARY OF CHAPTER 5

The Food Consumption Score (FCS) and Food Consumption Groups (FGCs) are core elements in the analysis of food security. The analysis found that approximately 11 percent of households were food insecure (4.1 percent and 7.0 percent of households with poor and borderline food consumption, respectively) at the time of the survey in June 2008. The food insecure groups are highly correlated with a poor dietary diversity. Rice and vegetables are the main dietary components of food insecure households. Fish consumption differentiates households in the poor and borderline consumption groups. Nonetheless, it should be noted that the survey was undertaken during the fish season when fish products were less expensive and more easily accessible. Thus, the percentage of food insecure households is expected to increase dramatically during the lean season (August-November 2008). During this time approximately 18 percent of households in Cambodia are estimated to be food insecure (6.8 percent and 11.5 percent of households with poor and borderline food consumption, respectively), suggesting that more than half a million households, or nearly 2.8 million individuals, will be food insecure. The analysis provided a description of the main characteristics of FCGs. Food insecure households have poor or very poor wealth index, and are highly indebted.

6. Risk Analysis and Vulnerability Context

Outline of the Chapter

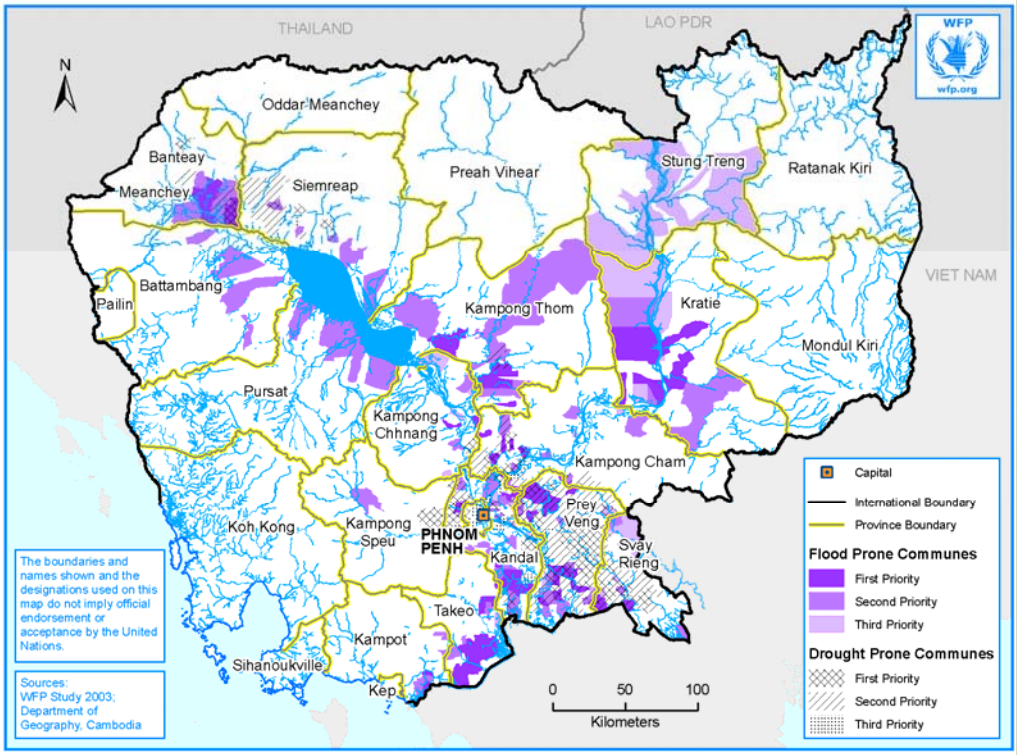
Chapter 6 analyzes the dimensions of vulnerability: the exposure to both natural and social hazards, the types of shocks experienced by households in the months before the survey, and the coping strategies put in place to counteract difficulties with access to food and shocks. These elements provide an important contribution to understand the vulnerability context of food insecurity in Cambodia.

6.1 Exposure to Natural and Social Hazards

6.1.1 Natural Hazards (Flood and Drought)

In 2003, a WFP/NCDM study classified the Cambodian communes by proneness to flood and drought[52]. Out of a total of 1,621 communes in Cambodia, 270 were classified as prone to drought and 260 prone to flooding. Many of these communes were prone to both drought and flooding. Map 9 shows the location of the areas affected by flooding and drought in the country.

Map 9: Communes exposed to flood and drought (1993)



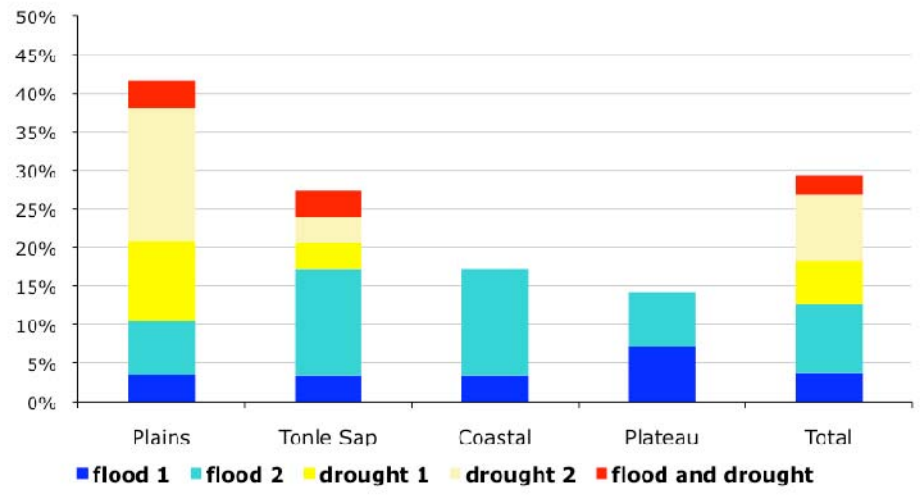
The WFP/NCDM 2003 study applied long-term indicators (derived from the analysis of the Vegetation Index in a time-series of satellite images and from rainfall data), and short-term indicators (mainly derived from agricultural statistics), to prioritize the

[52] WFP/NCDM, 2003, Mapping Vulnerability to Natural Disasters in Cambodia, Phnom Penh.

Cambodian communes in terms of risk exposure to flooding and drought. This prioritization of communes is a useful proxy for the exposure of households to drought and flooding hazards. The priority levels were used to investigate the proportion of households included in the CFSVA survey that live in communes prone to natural hazards. Findings indicated that 40 percent of Cambodian households live in areas prone to natural hazards.

Chart 47 reports[53] the proportion of surveyed households with high and medium intensity of exposure (as expressed by priority levels 1 and 2, respectively, of the WFP/ NCDM study) by ecological zone. Overall, 22 percent of the households are exposed to hazards of intermediate level: 11 percent to flood and 11 percent to drought. Another 11 percent of households are highly exposed (seven percent to drought, and four percent to flood, respectively), and approximately three percent of the households are exposed to both natural hazards[54]. The exposure to drought shows a clear spatial pattern with higher prevalence of risk-exposed (high and medium intensity of exposure) households in the Plains zone. The Tonle Sap and Coastal zones have the highest proportions of households exposed to flooding.

Chart 47: Percentage of households exposed to hazards, by type of hazards and intensity and by ecological zone



6.1.2 Social Hazards - Risk of Price Increases

Increases in the price of food commodities are a main hazard for local households and for their food security status. Earlier analysis (Chapter 4) indicated that the Cambodian economy was affected by increases in the price of rice, although there was a simultaneous increase in wages and salaries.

The Terms of Trade (ToT) approach in Chapter 4 was modified to take into account the fact that not all households have a wage-earning member and that job opportunities are

[53] To facilitate reading the scale has been reported to 0 and 50%.

[54] This is confirmed by a recent World Bank document, which states: '*Provinces such as Prey Veng may even be hit by both floods and drought in the same year. However, only about 40,000 out of the 310,000 hectares of cultivated land in Prey Veng are estimated to have irrigation systems, meaning that over 80 percent of cultivation depends completely on seasonal rainfall and weather. Therefore, most farming households bear the full brunt of floods, droughts, and pest infestations.*' World Bank, 2006, Managing Risks and Vulnerability in Cambodia, p.17.

not equal across local labor markets. A new ToT ratio was then computed for each surveyed location using survey-collected information on agricultural labor and urban unskilled worker wages. Surveyed villages were thus classified by five levels based on the intensity of ToT changes. Table 24 shows the definitions of thresholds applied for classification (the percentage change refers to the increased or decreased quantity of rice that a daily wage unskilled labor can purchase).

Table 24: Terms of Trade changes June 2007- June 2008

Much worse	More than -50%
Worse	Between -50% and -20%
No change	Between -20% and +20%
Improved	Between +20% and +50%
Much improved	More than +50%

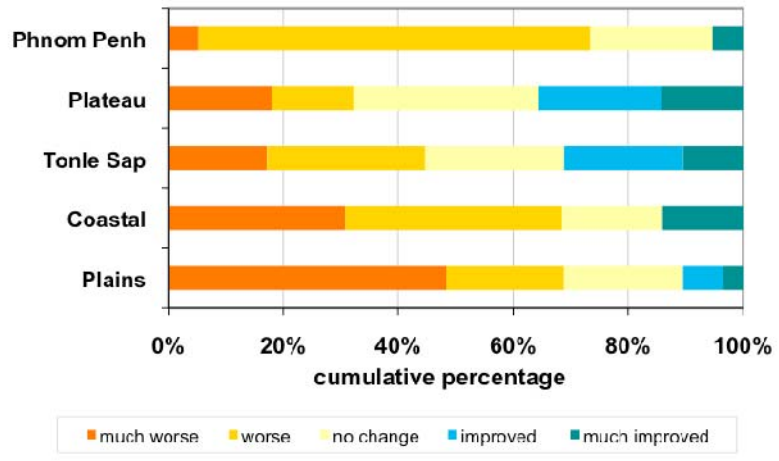
Between June 2007 and 2008, the ToT deteriorated for 57 percent of the surveyed households (Table 25).

Table 25: Percentages of households by ToT change categories (June 2007-08)

Much worse	**31.8**
Worse	**25.6**
No change	23.0
Improved	12.0
Much improved	7.7

Chart 48 reports the changes in the ToT by ecological zone. The Plains and Coastal ecological zones were the most affected. For nearly 80 percent of households in these zones the increase in wages was unable to balance the increase in rice prices. The Tonle Sap and Plateau/Mountain ecological zones were the least affected, as the ToT improved for more than 30 percent of households. Finally, Phnom Penh was heavily affected by the overall worsening ToT trend. However, it should be noted that the high (unskilled) labor demand in Phnom Penh counteracts the decreasing ToT.

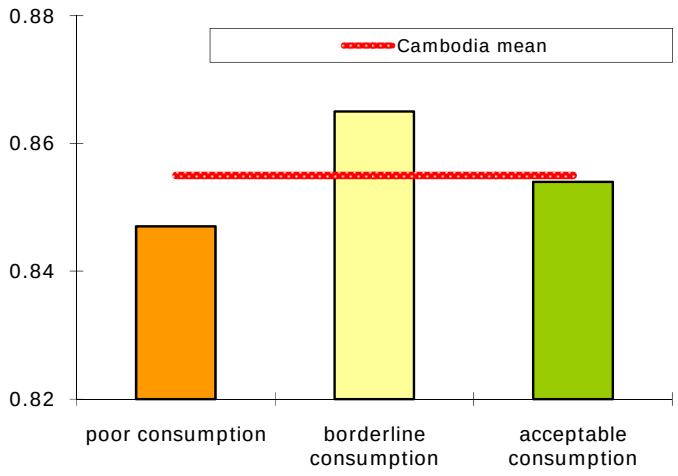
Chart 48: Percentage of households exposed to Terms of Trade changes (June 2007-2008) by ecological zone



The changes in ToT might affect households in different ways based on their food consumption groups (Chart 49). Households belonging to the poor food consumption

group are more likely to be exposed to price risks. In the chart, the red horizontal line marks the ToT changes at national level (0.855, where 1.0 means no change).

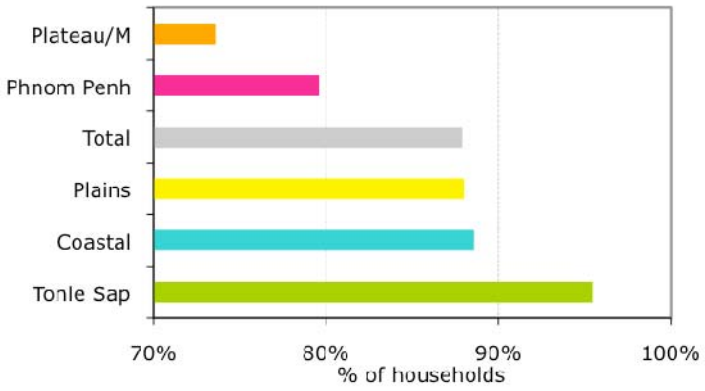
Chart 49: Terms of Trade mean changes by food consumption groups



Local Perceptions on Difficulties in the 6 Months Preceding the Survey

Gathering local perceptions is important to understand the impact that natural and social hazards had for local livelihoods. The HHQ survey asked respondents to list spontaneously, and in order of importance, the three most important difficulties experienced in the six months before the survey. Chart 50 shows the percentage of households that faced difficulties, between January and June 2008, by ecological zone. Nearly all households in the Tonle Sap zone declared they had faced some kind of difficulty. Plains and Coastal ecological zones showed percentages very near to the national average, while responses in Phnom Penh and Plateau/Mountain were less negative.

Chart 50: Percentage of households who faced difficulties during January and June 2008 by ecological zone



Overall, the difficulties reported were: 1) High food prices (40 percent of the answers); 2) Sickness/health expenditures (24 percent); 3) High fuel/transportation prices (12 percent); and 4) Debts to repay (10 percent). These difficulties account for 86 percent of the total difficulties mentioned.

In Phnom Penh and in the Plains zone, more than 60 percent of the surveyed households reported the high food prices as their main difficulty. In Phnom Penh, the situation was exacerbated by high fuel and transportation costs. The Tonle Sap and Coastal zone households were more frequently affected by sickness/health difficulties (29 percent and 33 percent respectively). In the Coastal zone, nearly six percent of the households experienced as principal difficulty the loss of employment or reduced salaries. This difficulty was reported on average in less than three percent of the cases in the other zones.

Urban households throughout Cambodia were more affected by high food prices, fuel/transportation prices, and electricity/gas costs relative to rural households, though rural households faced more difficulties from sickness/health expenditures.

In the first three Wealth Index quintiles (e.g. poorer households), approximately 90 percent of households were affected by difficulties in the past six months, while the better off wealth quintiles had a lower prevalence (83 percent). High food prices affected all wealth quintiles almost equally. Difficulties related to sickness/health expenditures were more frequently reported by poorest quintiles, while difficulties related to high fuel/ transport prices were primarily associated with the better-off quintiles. The burden of debt mainly affects the poorest quintiles.

Households in the poor food consumption group reported difficulties related to the high food prices and to sickness/health expenditures more frequently than the other groups. The difficulties related to 'Repaying debts' were most frequently reported among households belonging to the borderline consumption group. Those related to 'High fuel/transport prices' were primarily detected among households belonging to the acceptable consumption group.

Livelihood groups more exposed to high food prices primarily live in urban areas. The most exposed are the 'Salaried'. This livelihood group also had the highest percentage of households who complained of 'High fuel/transportation' costs. Households belonging to the 'Garment factory' group reported difficulties due to high food prices and most frequently reported difficulties from the 'Loss of employment/reduced salaries'.

6.2 Coping strategies and Coping Strategy Index

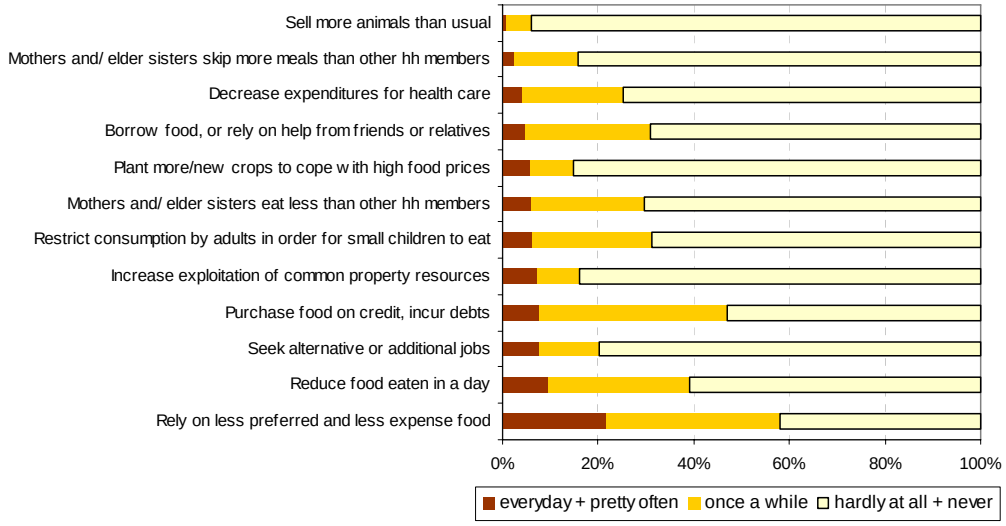
Households' vulnerability to food insecurity is the result not only of the exposure to hazards and shocks, but also of the inability to respond and cope with them. Well-established research on food security and vulnerability developed and tested a Coping Strategy Index (CSI). This indicator represents a useful proxy for the households' responses to difficulties in the access to food. The index is built from summing the frequencies of each coping mechanism multiplied by a weighting factor representing the gravity (seriousness) associated with each coping mechanism. For instance, the weighting system considers the coping mechanism of 'Restriction of consumption by adults in order for small children to eat', as a coping strategy more serious (and therefore with a higher weight) than the strategy 'Rely on less preferred and less expensive food'. A high CSI typically reflects an intense use of coping mechanisms, which in turns implies threatened household food security.

To build the CSI, the 2008 CFSVA asked households the following: 'During May 2008 were there times when [anyone in your household] did not have enough money to buy food or cover other essential expenditures (health, cooking facilities, school, etc)'. The

answers were clustered into three categories based on frequency: 'Everyday + pretty often', 'Once a while' and 'Hardly at all + never'[55].

Approximately 22 percent of Cambodian households had to 'Rely on less preferred and less expensive foods' every day or pretty often. Another frequent answer was 'Reducing food eaten in a day' which was reported as a coping mechanism in 40 percent of the surveyed households. Approximately 50 percent of households had to purchase food on credit, by incurring debt. In 15 percent of cases, this coping strategy was adopted every day or pretty often (Chart 51).

Chart 51: Frequency of the main coping strategies expressed as percentage of households applying them



The Tonle Sap ecological zone was the area where 'To rely on less expensive and less preferred food' was prevalent, while 'Reducing food eaten in a day' was prevalent in Phnom Penh and in the Plains zone. The gender-related coping strategy, 'Mothers and elder sisters eat less and/or skip more meals than other household members', was frequently reported in Phnom Penh. 'Purchasing food on credit, incurring in debts' happened mainly in the Plains zone, while 'Seeking a job' was more often reported in the Tonle Sap zone. Finally, the coping mechanism 'Increase the exploitation of common property resources' was most frequent in the Plateau/Mountain ecological zone.

Relationships between CSI, Food Consumption and Wealth

Values of the Coping Strategy Index (CSI) decreased in the wealthiest quintiles. The relationship was highly significant (R^2=0.113, p<0.01). In addition, the coping strategies directly linked to food access and food consumption were more frequently reported in households belonging to the poorest quintiles. Likewise, there was a highly significant relationship between the food consumption groups and the CSI (R^2=0.024, p<0.01). Values of the CSI decreased when moving from the poor consumption group to the acceptable food consumption group. Overall, CSI values are higher in rural than in urban areas.

[55] Answers were weighted as follows: 'pretty often' answers were attributed half of the weight of the 'Everyday' answers, and similarly, 'Hardly at all' answers were attributed half of the weight of 'Never'.

Table 26 and 27 below report the CSI values by livelihood group, by urban versus rural strata, and by ecological zone. Values close to the national average are reported in yellow; higher values are reported in red and lower values in green. Only two percent of the surveyed households 'Took out their children from school' (Every day or pretty often), as one of the coping strategies to face constraints in access to food. However, there are clear differences in the food consumption and livelihood groups. Nearly five percent of the households in the poor consumption group reported having withdrawn their children from school "every day or pretty often" to deal with food shortages as opposed to one percent in the acceptable consumption group. The 'Agriculture', 'Casual Labor', 'Farmer & Casual labor' and 'Farmer & Construction' groups had the highest percentages of households that adopted this strategy "every day or pretty often" in the month preceding the survey.

Four livelihood groups, 'Agriculture', 'Garment Factory', 'Construction' and 'Casual Labor,' had above-average values (and therefore higher and more frequent need to adopt coping strategies) in rural and urban areas and in the capital. In addition, the 'Farmer & agriculture' livelihood group had a very high CSI value in Phnom Penh. The average value in the Coastal area is higher than the national average. Close to national average are highlighted in light yellow, above national mean are in light orange, and below national average figures are in light green.

Table 26: Coping Strategy Index by livelihood groups and urban/rural strata

	Phnom Penh	**Other urban**	**Rural**
Livelihood activities	Average values		
Farmer & agriculture	21.0	4.6	12.2
Farmer & garment factory	6.3		10.5
Farmer & construction	15.9	5.1	14.2
Farmer & self employment	6.2	12.1	9.8
Farmer & casual labor	12.0	1.9	13.6
Farmer & salaried	4.2	2.9	7.7
Farmer & livestock and fish	0.0	0.0	14.7
Farmer & others	6.5	5.6	11.5
Agriculture	12.2	10.0	18.2
Garment factory	14.9	11.0	6.7
Construction	10.2	14.8	14.3
Self employment	8.9	6.5	9.1
Casual labor	14.5	8.9	17.8
Salaried	7.5	4.6	12.7
Livestock and fish	3.0	11.7	13.4
Others	17.5	6.8	9.5
National average	9.1	6.7	12.0

Table 27: Coping Strategy Index by ecological zone and urban/rural strata

	Phnom Penh	**Other urban**	**Rural**
Ecological zone	Average values		
Phnom Penh	9.1		
Plains		6.8	12.8
Tonle Sap		6.3	11.2
Plateau		6.8	11.1
Coastal		7.7	11.2
National average		6.7	12.0

6.3 Social Safety Nets

According to the HHQ survey results, 1 out of 4 Cambodian households received some kind of assistance during the 'last three months' preceding the survey (e.g., before June 2008). The highest level of assistance was registered in the Tonle Sap zone, where 42 percent of households received some kind of assistance (Table 28).

Table 28: Percentage of households who received assistance during the last 3 months (before June 2008) by ecological zone

Tonle Sap	42%
Coastal	21%
Plateau/Mountain	20%
Plains	19%
Phnom Penh	12%
Cambodia	26%

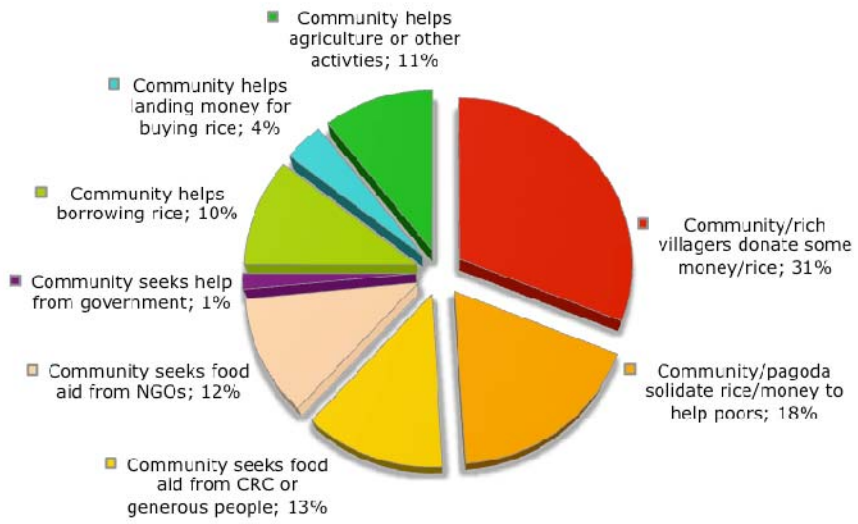
Assistance was provided in different forms: food assistance, cash, free health care, inputs, and services for agriculture. The most frequently reported type of assistance was 'Free health care/drugs from an NGO-run programme' which was mentioned by nearly 20 percent of the assisted households. The cash components (either as cash transfers or micro-credit) played an important role in 25 percent of the cases. In-kind assistance (e.g. food) also had a significant role (about 20 percent of the assisted households). Services and assistance for agriculture were instead rather marginal.

The Tonle Sap zone received more assistance under the 'Free health care/drugs from an NGO programme' and from 'Services/inputs for agriculture', while the Plains zone benefited more from assistance from 'Free food rations for households'. In the Coastal zone, assistance was mainly in the form of 'Health care/drugs from NGO programmes'.

The survey gathered a qualitative comparison between the kind of assistance received by households and the kind of assistance they actually wanted to receive in order to facilitate coping with increasing food prices. 'Free health care/drugs, from NGO programmes' was regarded as important, while the cash component was less relevant (in particular in the form of micro-credit). It was noted that nearly 18 percent of the surveyed households requested assistance in the form of free food rations for households and approximately 12 percent requested assistance to acquire agricultural inputs.

Key informants in the villages reported diverse coping strategies adopted during food shortages (Chart 52). Food assistance plays a significant role together with community-based forms of solidarity. For instance, the role of community in borrowing rice, or lending money for buying rice is considerable. However, long-term strategies, such as assisting farmers to plant diverse varieties of rice, diversifying crop production, raising livestock, improving irrigation systems, or starting small business activities, were not reported.

Chart 52: Community strategies applied during food shortages



6.4 Risk Analysis: combined Risk from Natural and Social Hazards

Approximately one-fourth of the Cambodian population is estimated to live in areas at risk of drought and flooding. Nevertheless, farmers learnt lessons from the drought of 1998 and the 2000 flooding and developed responses strategies such as the introduction of cropping rice varieties resistant to drought and of modified and improved construction systems to counteract these hazards.

The recent increase in the price of rice is, however, new to Cambodia. It differs from the price seasonality that traditionally affects Cambodian households and for which coping strategies are already in place. The recent increase affected relatively more the urban population that is more dependent on the market than the rural one. Approximately one-fifth of all Cambodian households were particularly affected by market shocks due to their higher market dependency for food consumption. Nearly 25 percent of these households live in areas moderately or seriously prone to drought. In addition, 15 percent of these households live in areas exposed to flooding.

Two 'rural' livelihood groups: landholders with job opportunities in activities related to construction ('Farmer & Construction') and those working as causal laborers ('Causal labor') are located in natural hazard areas. They constitute approximately 15 percent and 10 percent, respectively, of rural households in Cambodia. The 'Farmer & Construction' group had among the highest decreases of the terms of trade during the first six months of 2008. They have very few resources to cope with natural and man-made hazards. This reduction in the ToT means that in a few months the amount of rice that a day's wage of unskilled labor could purchase decreased by one kilogram. Households in the 'Casual labor' group face similar difficulties: One-fourth of these households live in drought prone areas and have few resources to cope with natural and manmade hazards; and two out of three belong to the poorest quintiles. Their ToT significantly worsened during 2008 as their purchasing power for rice diminished by 20 percent.

A quarter of the households working in garment factories live in drought prone areas and one fifth of them in flood prone areas. Nearly 30 percent of the households living mainly on livestock and fisheries are exposed to flooding.

Among urban livelihood groups, market hazards pose a greater risk to households, while natural hazards interrupt job opportunities (for instance in construction activities). Marginal groups, related to 'Casual labor' and 'Construction', were relatively more affected by the increase in rice prices due to lack of resources. Even livelihood groups with higher Wealth Indices, such as 'Garment factory' households (these are mainly female-headed) were affected by the price rise. This group lost approximately one-third of their purchasing power during the period of price increase.

SUMMARY OF CHAPTER 6

The chapter investigated the exposure of urban and rural households to natural (mainly drought and flooding) and social hazards. It also explored the coping strategies that are put in place by households and villages to counteract such shocks and difficulties, especially as they face deteriorating access to food. In the six months preceding the survey, more than half of the households experienced the increase in the prices of food as their main difficulty. Overall, nearly 10 percent of the households had difficulties due the burden of debts. Households in the poorest wealth quintiles are more likely to be heavily indebted and to experience constraints to repay their debts.

The Coping Strategy Index was highly correlated to both the poor food consumption group and the poorest wealth quintiles. These households experienced serious difficulties in the access to food in the months preceding the survey. Overall, the CSI was higher among rural households, although these households could rely more on own production and were, therefore, less vulnerable to the price fluctuations of the market compared to urban households. Four livelihood groups, 'Agriculture', 'Garment Factory', 'Construction' and 'Casual Labor,' had above average values of the CSI (and therefore higher and more frequent need to adopt coping strategies) in both the urban and rural areas. The 'Agriculture' and 'Casual labor' groups also had the highest percentages of households that frequently took their children out from school when experiencing difficulties in access to food. In addition, a significant proportion of these livelihood groups are located in areas exposed to drought and flooding. Social protection programs were primarily in the form of health assistance activities.

7. Profiles and Underlying causes of Food insecurity

Outline of the Chapter

Food security is a complex construct reflecting multiple dimensions: food availability, food access and food utilization. The Food Consumption Score is commonly used as a proxy-measure of the current food security situation because it is a reliable and easily replicable measure that correlates well with more complex measures (e.g., caloric intake). This chapter summarizes the analyses of previous chapters to highlight the main determinants of food security among Cambodian households.

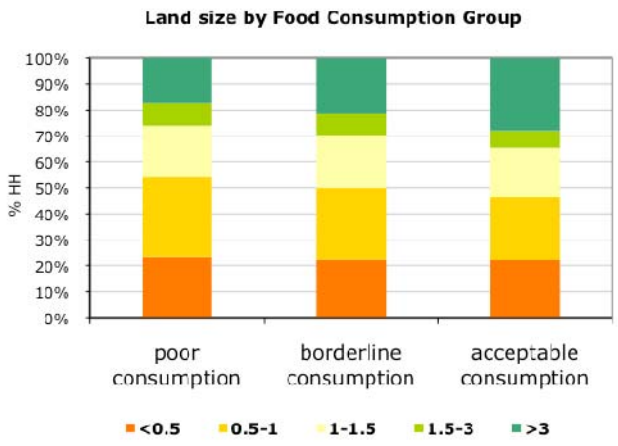
7.1 Determinants of Households Food Insecurity

The analysis showed that rural households in Cambodia are more affected by food insecurity than their urban counterparts: more than 1.5 million food insecure people live in rural areas, while only 150,000 people were considered food insecure in urban areas.

Land tenure status plays an important role in determining food insecurity. The landless and those that lease the land they cultivate, who represent 19.3 percent of the rural population, are more likely to be food insecure compared to land owners. The lack of property title is higher among the poor and borderline consumption households (51 percent on average) than among acceptable food consumption households (38 percent). This suggests insecure land tenure is among the constraints for development in the agricultural sector.

The size of farmed land was also a significant factor in determining food insecurity (Chart 53). The poor and borderline consumption groups had a significantly higher proportion of households cultivating small plots of 0.5 to one ha (54 percent and 50 percent, respectively). Landowners with more than three ha are significantly ($p<0.05$) associated with the acceptable food consumption group (28 percent) compared to the poor and borderline food consumption groups. There was a higher percentage of poor consumption households (32 percent) that own only livestock compared to food secure households (27 percent).

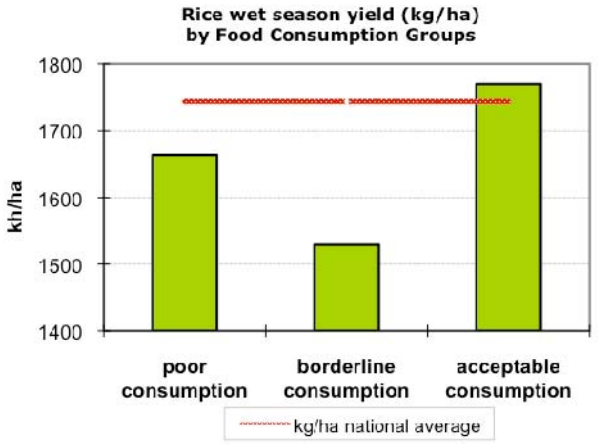
Chart 53: Size of cultivated land by Food Consumption Group



Crop diversification is well associated with food secure households. While wet rice was the only farmed crop for all poor consumption farmers, borderline consumption households also cultivated maize. Households belonging to the acceptable food consumption group cultivated wet and dry rice, permanent crops, cassava and maize.

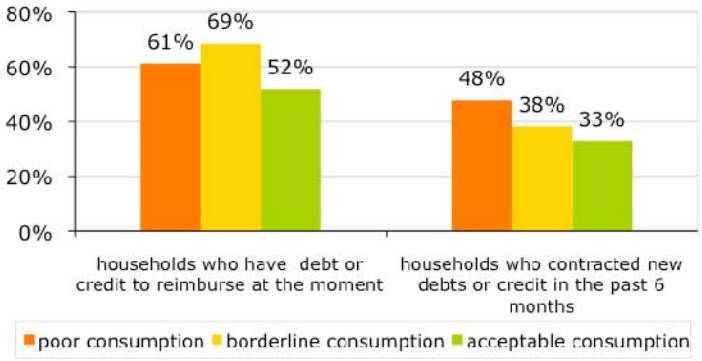
The survey suggested that limited economic resources, scarce cultivable land, and possibly lack of technical skills to diversify crop production, are important factors determining the current food insecure status (Chart 54).

Chart 54: Wet season rice yield (kg/ha) by Food Consumption Groups



Food insecure households have significantly higher debt burdens than the acceptable consumption households (Chart 55). The highest accumulation of debt has been found among borderline households (69 percent). The survey indicated that the recent rise of prices had serious consequences for poor consumption households since 48 percent of them have contracted new debts since March 2008. Among acceptable food consumption households, debts were mainly contracted to expand entrepreneurial activities. Instead, poor food households contracted new debts to face seasonal or exceptional constraints, such as the sickness of a family member (and related costs) or the increase in the price of rice. This likely creates a vicious cycle in which households are more and more indebted and are more likely to adopt negative coping strategies such as the selling of productive assets to face the shortage of food.

Chart 55: Debts and recent debts by Food Consumption Groups

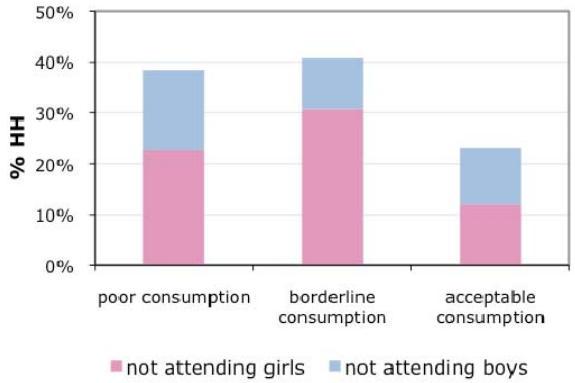


The survey showed that approximately 98 percent of Cambodian households rely to some extent on cash earnings for their livelihoods. Cash income opportunities differ between the food consumption groups. Poor and borderline food consumption households have a significantly higher percentage (42 percent) of a single member with cash income as compared to acceptable consumption households (30 percent). Households with acceptable consumption typically have several members with cash income (nearly 70 percent). Food insecure households are then more sensitive to job

opportunity fluctuations. The situation is exacerbated among those households with a high dependency ratio.

Food insecure households, and in particular borderline consumption households, are characterized by a higher prevalence of primary school age children not attending school when compared with food secure households (Chart 56). The chart below also suggests that food insecure households tend to have a higher percentage of girls non-attending than boys. A more fine-tuned analysis further demonstrated that while 'not attending' is higher among borderline consumption households, the increase between January and June 2008 was more significant among poor food consumption households (almost double). This finding implies that education opportunities are more limited for food insecure households, particularly for girls. While causal patterns cannot be easily established, the survey suggested that the lack of education is a main determinant of the food insecurity. In the long-run, the lack of education further hampers the capacity of the households to acquire a more secure status through specialized and better paid jobs.

Chart 56: Children not attending primary school



Most Cambodian households (93 percent) declared that their expenditures increased since December 2007, and very few declared 'no change' (four percent) or 'decreased' (three percent). Nearly all (97 percent) of poor food consumption households increased their expenditures, mainly on food, health care and energy (electricity or batteries). Food secure households increased their expenditures primarily on cooking fuel and education.

The results suggest that the access (both physical and economic) to basic services and transport infrastructures plays a significant role in the current food insecurity status. For instance, poor physical access to market outlets make farmers dependent on external buyers. They are, therefore, less capable of negotiating higher profitable prices for their production. Likewise, constraints on economic access to health services were reported by rural households and were among the main causes for contracting new debts.

Summary of Chapter 7

Chapter 7 provided a profile of food insecure households and highlighted the main determinants of food insecurity. Establishing causal patterns often proves to be difficult particularly when analyzing the multi-dimensional character of food security. Despite the financial and time constraints, the combination of CFSVA primary and secondary data and of both qualitative and quantitative methods were successful in gathering important elements that enhance current understanding of the causes of food insecurity. The analysis clearly indicates that limited education opportunities, limited access to services

and infrastructure, and reduced development of the farming sector are proximate causes of the food insecurity in Cambodia.

8. Conclusions and Recommendations

8.1 Profiles of Food Insecurity

The 2008 CFSVA addressed the main questions of food security investigations: how many, who and where are the food insecure, and what are the risks and constraints to their food security. This information led to a better comprehension of the main determinants of food insecurity in the country. These findings are summarized in profiles of food insecurity and in a number of recommendations that should be addressed to improve food security conditions in Cambodia.

How Many Are Food Insecure?

The study found that 11 percent of surveyed households were food insecure at the time of the survey (four percent and seven percent of households had poor and borderline food consumption, respectively). At the national level, this would account for more than 300,000 households (and approximately 1.7 million individuals) who are classified as food insecure. The survey was conducted during the fishing season when food intake generally improves due to greater availability of fish products. Therefore, this estimate is projected to increase to more than 18 percent of the population, or half a million households (and therefore approximately 2.8 million individuals), who would be classified as food insecure during the peak of the lean season (August to November 2008).

Where Are The Food Insecure?

Rural areas are more affected by food insecurity: more than 1.5 million food insecure people live in rural areas, while only 150,000 people can be considered food insecure in Phnom Penh and other urban areas.

In rural Cambodia, 12.5 percent of the households had poor and borderline food consumption (4.4 percent and 8.0 percent, respectively). This means that one out of eight rural households is food insecure. Rural Tonle Sap zone had the highest percentage of poor and borderline food consumption households (eight percent and nine percent, respectively). Rural Plateau/Mountain ecological zone has a similar presence of food insecure households. In this region, there was, however, a lower proportion of poor food consumption households (3.5 percent) compared to borderline food consumption households (13 percent). Approximately seven percent of rural households in the Coastal zone were food insecure (1.3 percent poor and 5.3 percent borderline food consumption, respectively).

In urban Cambodia, only 5.5 percent of households were considered food insecure. There are differences between Phnom Penh and the other urban areas. Phnom Penh is least affected by food insecurity: 98.6 percent of the households living in the capital have acceptable food consumption.

The highest presence of urban food insecure households was encountered in the Plains zone (8.9 percent), where all the food insecure households belong to the poor food consumption group. A similar frequency was found in the Plateau/Mountain ecological zone, where, however, there was a higher proportion of borderline food consumption households. Urban areas in the Tonle Sap zone had 2.2 percent and 5.6 percent, respectively, of poor and borderline food consumption households.

WHO ARE THE FOOD INSECURE?

- Households with poor and borderline food consumption are highly associated with the poorest wealth quintiles;

- They also have less productive assets, such as land and livestock, than households with acceptable food consumption. They own and cultivate small plots of land, and are more often landless than food secure households;

- Poor food insecure households rarely diversify their agricultural production from wet-season rice, whereas households with acceptable food consumption cultivate both wet and dry-season rice, tree crops, cassava and maize;

- A significantly higher proportion of food insecure households have only one member with cash-earning activity. The prevalence of a high dependency ratio is also higher compared to the food secure households;

- Poor and borderline food consumption households are heavily indebted. A higher percentage of them contracted new debts in the months before the survey. They often contracted new debts to buy food and to cover health-related expenditures. In contrast, acceptable food consumption households contracted new debts primarily to start or expand entrepreneurial activities;

- Food insecure households have a significantly higher percentage of children not attending primary school. The proportion is particularly high among girls in the poor and borderline food consumption groups.

The following livelihood groups had the most significant percentage of households in the poor and borderline food consumption groups:

- 'Farmer & Others' includes households with cash income from pensions and remittances, although farming activities are still important. They primarily live in rural areas. Nearly one-fourth of the households in this group are female-headed (higher than the national average). These households cultivate only rice and have less livestock assets than other groups. More than 25 percent of these households belong to the poorest wealth quintile. Approximately 40 percent of these households have only one member with cash-earning activity. One-fourth of these households is food insecure (eight percent have poor and 17 percent borderline food consumption, respectively);

- The 'Casual labor' livelihood is mainly composed of urban households. Casual labor is the primary source of cash income. More than 25 percent of these households are female-headed (higher than national average). Nearly 70 percent of the households in this group belong to the poorest wealth quintiles. They have few productive assets such as land and livestock. The non-attendance rate among primary school age children is particularly high among girls (nearly 28 percent). Taking children out from school was reported as one coping strategy to face difficulties in the access to food. Nearly half of these households only have one cash-earning member. They are typically landless. The lack of own production means they are highly exposed to the difficulties associated with the increase in the price of rice. They had among the highest Coping Strategy Index. Approximately 17 percent of these households is food insecure (six percent and 11 percent, respectively, of poor and borderline food consumption households);

- The 'Farmer & construction' group is composed of households mostly dependent on own production and employment in the construction sector. This is primarily a rural livelihood group. These households have a high prevalence of households with migrated family members (more than 50 percent). They cultivate rice almost exclusively. Approximately 60 percent of them belong to the lowest wealth quintiles. Nearly half of them contracted new debts in recent months, mainly to cover health expenses. Like previous livelihood groups, the non-attendance rate is particularly high among these households (especially for girls) and these households often take their children out from school when they face difficulties in the access to food. Households bellowing to this group and living in the capital had a higher than average value of the CSI. 17 percent of these households are food insecure (five percent of this group has poor food consumption and 12 percent have borderline food consumption).

The latter two livelihood groups have a significantly high proportion of households living in drought-prone areas.

The 'Agriculture' and 'Farmer & Casual labor' and 'Farmer & Agriculture' livelihood groups also had a high proportion of poor and borderline food consumption households (11 percent and 14 percent respectively for the other two groups, respectively) and high proportions of them in the lowest wealth quintiles. The first two groups also had among the highest proportion of households that took their children out from school as one of the coping strategies to face constraints in the access to food. The CSI of these groups was particularly high in the Phnom Penh and in the other urban areas.

Number of Current Food Insecure Households/People by Ecological Zone

Ecological Zones		Poor Food Consumption		Borderline Food Consumption		Total Food Insecure HH	Total Food Insecure People
		HH (#)	People (#)	HH (#)	People (#)		
Plains	Rural	33,965	169,826	79,029	395,146	112,994	564,972
	Urban	11,322	56,609	---	---	11,322	56,609
	Total	45,287	226,435	79,029	395,146	124,316	621,581
Tonle Sap	Rural	58,678	293,392	63,999	319,993	122,677	613,385
	Urban	3,667	18,337	9,143	45,713	12,810	64,050
	Total	62,346	311,729	73,141	365,707	135,487	677,436
Plateau	Rural	11,272	56,362	46,568	232,841	57,841	289,203
	Urban	1,610	8,052	803	4,015	2,413	12,066
	Total	12,883	64,414	47,371	236,856	60,254	301,269
Coastal	Rural	2,121	10,604	9,306	46,528	11,426	57,132
	Urban	424	2,121	1,269	6,345	1,693	8,466
	Total	2,545	12,725	10,575	52,873	13,120	65,598
Cambodia	Phnom Penh	509	2,546	2,539	12,694	3,048	15,240
	Rural	106,037	530,185	198,902	994,508	304,939	1,524,693
	Urban	17,024	85,118	11,215	56,073	28,238	141,191
	Cambodia	123,570	617,849	212,655	1,063,275	336,225	1,681,124

*NIS population projection 2008 was used to estimate # of food insecure households.

8.2 General Policy Recommendations

Decision makers should prioritize interventions to assist the 'highly food insecure' households (e.g., households in the Poor Food Consumption group), who are least prepared to cope with rising food prices. The people in this category are the most at risk of entering a 'vicious circle of de-possession', social marginalization and serious food insecurity.

A broad multi-sector and integrated approach is needed in Cambodia to improve food security and reduce the vulnerability of both rural and urban households. Thus, investments in infrastructure, interventions in agricultural productivity and crop diversity, and in the service sector, especially education and health, and market developments are all needed.

The main general and sectoral recommendations derived from the 2008 CFSVA survey are given below. These include recommendations on the establishment of food security monitoring systems to keep track of progress and inform decision makers about potential threats.

1. Households with poor food consumption depend mainly on a diet very poor in terms of protein, fat and micronutrients. The 'Farmer & Other' and 'Farmer & construction' groups in the rural areas and the 'Casual labor' group in the urban areas should be primarily targeted. Food-based interventions should include sources of fats and proteins, such as pulses and vegetable oil. In addition, micronutrient supplementation and awareness of nutritional food should be promoted, particularly among women and young children;

2. The survey showed that the non-attendance rate among children in primary school age is particularly high in rural areas and in food insecure households. Findings suggest that non-attendance is higher among girls. Coordinated and joint efforts are needed to enhance and expand effective existing programmes, helping to improve access to education. Interventions should target food insecure households in the Tonle Sap, Plains, and the Plateau/Mountains zones. In addition, an in-depth assessment should be conducted to understand better the reasons underlying the high rates of non-attendance and dropout rates in schools;

3. Farmers are heavily affected by debts, obliging them to sell at low prices (mainly rice) immediately after the harvest. Measures should be studied and implemented to assist poor farmers, for instance, by creating village banks, rice banks and micro-credit schemes. Food insecure households are those more likely to contract new debts to buy food and cover unexpected health expenditures;

4. The development of social protection programmes and safety nets targeting the poorest and most vulnerable households already are key points of the National Strategic Development Plan (NSDP) 2006-2010. Findings of the CFSVA further warrant recommendations to promote the development of safety nets and social protection mechanisms such as the creation of jobs in the formal and informal sectors, the establishment of health insurance and improved delivery and quality of health services. Targeted social safety activities should also aim enhancing the capacity of highly vulnerable households to cope with natural disasters such as drought and floods.

5. Access to wild resources through fishing, gathering, and hunting represents a significant source of both income and food for the rural population. This provides most of the proteins and fat components of their diet. Forest privatization currently increases the difficulties in accessing common property natural resources. The issue is particularly important in the Plateau/Mountain zone. Policy interventions to promote a sustainable management of natural resources should be preceded by more in-depth analysis of current uses, rates of exploitation, and principal environmental threats such as deforestation and overfishing and their implications for local livelihoods;

6. The study showed that the cropping systems significantly changed in recent years, opening new perspectives for rural development. Changes in cropping systems should be monitored to understand their relevance for the sustainable use of resources. Crop diversification and tree plantations should be encouraged;

7. The survey demonstrated that the scarce development of rural infrastructure seriously hampers the potential of the agricultural sector. Transportation, storage facility, communication and marketing infrastructure should all be enhanced in rural areas in all zones to help farmers increase the profitability of their production (e.g. higher prices and easier transport). This points to the importance of improving rice storage capacities for paddy and processed rice as well as milling capacities at the community level. Farmers should be encouraged to create farmers associations to be able to negotiate higher selling prices with external buyers;

8. The CFSVA indicated that seasonal and geographic variations in food security are important in the country. Further efforts should be made to coordinate and strengthen a Food Security Monitoring System, which should include a market component. Agro-ecological zones are an important element in analyzing and reporting food security-related data. The zone boundaries should be updated to improve the quality of reporting.

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