

FAO - NUTRITION COUNTRY PROFILES

CAMBODIA



**FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS**

Note for the reader

The objective of the Nutrition Country Profiles (NCP) is to provide concise analytical summaries describing the food and nutrition situation in individual countries with background statistics on food-related factors. The profiles present consistent and comparable statistics in a standard format. This pre-defined format combines a set of graphics, tables and maps each supported by a short explanatory text. Information regarding the agricultural production, demography and socio-economic level of the country are also presented.

In general, data presented in the NCP are derived from national sources as well as from international databases (FAO, WHO...).

Technical notes giving detailed information on the definition and use of the indicators provided in the profile can be obtained from the Food and Nutrition Division, Assessment and Evaluation Service upon request. An information note describing the objectives of the NCP is also available.

Useful suggestions or observations to improve the quality of this product are welcome.

The data used to prepare the maps are available in Excel upon request at:

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Graphs, tables and maps can be visualised by clicking on the words in bold and underline, only in the "Full profile" pdf file

SUMMARY

Cambodia's tragic history has prevented use of any trend analysis since the country as been recovering from more than 20 years of civil strife. Essentially, there is a general lack of specific nutrition information on Cambodia but current information on crop production and child nutritional status is being collected more and more now that the focus of the government and its counterparts has turned towards development rather than relief.

According to the findings of the MICS survey, malnutrition in children 6-59 months old continues to be a major problem in Cambodia based on the three commonly used indicators. The prevalence of underweight was 52%, that of stunting was 56% and 13% of children were wasted. Although all provinces were affected by child malnutrition there were important provincial differences in the prevalences of the three anthropometric indicators. The prevalence of underweight ranged from 41% in Banteay Meanchey to 63% in Stung Treang which also showed the highest prevalence of wasting (16%) (**Maps 2, 3 and 4**). The prevalence of stunting ranged from 40% in Phnom Penh to 70% in Kampong Spueu. The prevalence of underweight, stunting and wasting were found to be higher in boys, therefore indicating that girls had a slightly better nutritional status. The prevalence of overweight was low overall with Kampong Spueu, having the highest rate (**Map 5**).

Women also seemed to be affected by malnutrition. According to the UNICEF/WFP survey, the prevalence of women 15 to 49 years old with a BMI < 18.5 kg/m² was 28.5%. As for children, the analysis by food economy zone showed that women in the forest were the most affected by CED with 60% having a BMI < 18.5 kg/m².

The FAO Sixth World Food Survey estimated that the DES in Cambodia did not cover the requirements of 29% of the population in 1990-92, compared to 13% in 1969-71, therefore indicating that the proportion of the population that is "undernourished" in terms of food inadequacy has increased. The problem is not only availability, but also access and utilization of food, as well as a lack of diversity in the diet of the typical Cambodian. As a consequence, there are high rates of night blindness in children 24-59 months (3.6%) and pregnant women (10%). The national weighed total goitre rate was 12% in school children aged 8 to 12 years. The provinces of Siem Reap, Ratanakini, Banteay Meanchey and Svay Rieng were found to have severe IDD problems with more than 30% of children 8-12 years old affected. According to a non-nationally representative survey conducted in 13 provinces the overall rates of anaemia in children 6-59 months (n=1348) were extremely high-82 percent. Moreover, 69% of women 15-49 years old (n=994) and 74% of pregnant women (n=97) were classified as anaemic.

The under five mortality rate was 90‰ live births in 1996 the infant mortality rate was 108‰ and the maternal mortality rate was estimated to be 473/100,000 in 1990. These rates, together with an adult female illiteracy rate of 58%, are the highest in the South East Asian region.

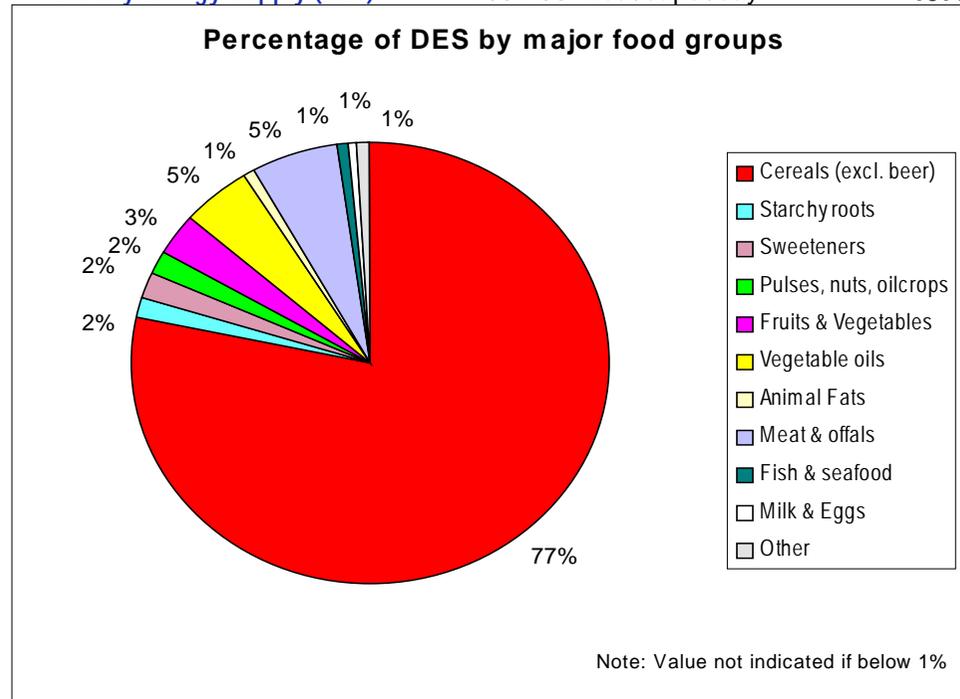
The nutrition of the typical Cambodian will improve with better access to health care, diversification of diet and of food production, education for mothers on the best child care practices, and access to safe water and sanitation at the local level. Poverty and malnutrition are found throughout the country but are much worse in certain locations. However, with the increasing stability of the government and support of the international community, improvements in production, consumption and utilization will continue, resulting in a stronger, healthier generation of Cambodians.

TABLE 1: GENERAL STATISTICS OF CAMBODIA

Indicator (\$)	Year	Unit of measure	
A. Land in use for agriculture			
1. Agricultural land	1995	ha per person	0.531
2. Arable and permanent crop land	1995	ha per person	0.381
B. Livestock			
1. Cattle	1994-96	thousands	2735
2. Sheep & goats	1994-96	thousands	...
3. Pigs	1994-96	thousands	2073
4. Chickens	1994-96	millions	11
C. Population			
1. Total population	1998	thousands	10751
2. 0-5 years	1998	% of total pop.	17.5
3. 6-17 years	1998	% of total pop.	30.1
4. 18-59 years	1998	% of total pop.	47.7
5. >= 60 years	1998	% of total pop.	4.7
6. Rural population	1998	% of total pop.	77.8
7. Population growth rate, Total	1995-2000	% of total pop.	2.3
8. Population growth rate, Rural	1995-2000	% of rural pop.	1.4
9. Projected total population in 2025	2025	thousands	16990
10. Agricultural population	1995	% of total pop.	72.8
11. Population density	1995	pop. per sq Km	55.4
D. Level of Development			
1. GNP per capita, Atlas method	1996	current US\$	300
2. Human Development Index rating	1995	min[0] - max[1]	0.421
3. Incidence of poverty, Total	...	% of population	...
4. Incidence of poverty, Rural	...	% of population	...
5. Life expectancy at birth (for both sexes)	1995	years	52.9
6. Under-five mortality rate	1996	per 1,000 live births	170
E. Food Trade			
1. Food Imports (US \$)	1994-96	% of total imports	11.3
2. Food Exports (US \$)	1994-96	% of total exports	5.2
3. Cereal Food Aid (100 MT)	1994-96	% of cereals imports	65.4
F. Indices of Food Production			
1. Food Production Index	1994-96	1989-91=100	118.4
2. Food Production Index Per Capita	1994-96	1989-91=100	102.6

Indicator (\$)	Year	Unit of measure	
G. Average Food Supply			

1. **Dietary Energy Supply (DES)** 1994-96 Kcal/caput/day **1979**



2. Proteins	1994-96	g/caput/day	46
% from:			
3. Vegetable products	1994-96	% of total proteins	79.5
4. Animal products	1994-96	% of total proteins	20.5
% Energy from:			
5. Protein	1994-96	% of total energy	9.4
6. Fat	1994-96	% of total energy	13.6

H. Food Inadequacy			
1. Total population "undernourished"	1990-92	millions	2.5
2. % population "undernourished"	1990-92	% of total pop.	29.0

... no data available § see References for data sources used
See Technical Notes for definitions used.

CAMBODIA

I. OVERVIEW

1. Geography

Cambodia has a land area of approximately 182,000 square kilometres (EIU, 1997-**General Map**). The country extends approximately 530 kilometres east to west, and 400 kilometres north to south. Thailand borders Cambodia in the west and in the north, while the eastern border is shared with Vietnam. The north east corner of the country is adjacent to Laos. Cambodia has a small coastline at its South West corner, running approximately 320 kilometres on the South China Sea.

Cambodia has a tropical climate characterised by two main seasons: the rainy season from May to October and the dry season from November to April.

While Cambodia is relatively small, there are 4 distinct zones defined by geographic characteristics. Forest covers almost 30% of the total area, mainly the north and south-western portions of the country. Lowland rainfed areas, primarily cultivated in rice, are found in the centre and west of the country. The Mekong River system, encompassing the Tonle Sap great inland lake, forms significant corridors of population and specialized agriculture and fishing. Finally, fringe zones of degraded forest form common buffers between dense forest and agricultural areas.

Administratively, the country is divided into 24 provinces, including 4 municipalities. These provinces are divided into districts that are further divided into 1,616 communes and 12,997 villages, with an average of about 8 villages per commune. The government's policy of decentralizing administration requires villages to form Village Development Committees (VDC) as the lowest administrative management unit at the community level.

2. Population

Cambodia's tragic history has prevented use of any trend analysis since the country has been recovering from more than 20 years of civil strife. The 25 years prior to 1991 were particularly tragic for Cambodia. They provide the major context within which the present political, economic, social and nutrition situation should be considered. For a quarter of a century, the country suffered the trauma of social upheaval through civil war, genocide, military invasion and occupation, and international isolation (MOP/UNDP, 1998).

In 1998, the first population census was conducted since the 1960s and the tables produced by mid-1999 will provide the first up-to-date demographic information in 30 years (NIS/MOP/UNFPA, 1998). However, in 1998 the total population of Cambodia was estimated to be 10.751 million inhabitants and is projected to reach 17 million by 2025 (**Table 1**). The rapid population growth continues despite the high under five mortality rate (115‰ - source: MOH) and the relatively low life expectancy at birth of 52.9 years (with an average of 50.3 years for men and 58.6 years for women).

Due to a recent history of war and profound social upheaval in the 1970's, the gender ratio is strongly female biased 93.1 males per 100 females. Despite this imbalance, the average household size of the country is relatively high, at 5.2, and the annual population growth rate was estimated to be 2.3% (between 1995-2000) (**Table 1**). The population is mainly rural (77.8%) and only 22.2% of the people are defined as urban and located in the

capital of Phnom Penh or province centres. Although the average population density is 55.4 persons/km², there are important provincial differences ranging from 2 to 301 persons/km² in Mondulkiri and Kandal Province, respectively (**Map 1**). The five provinces of Steung Treng, Ratanakiri, Mondol Kiri, Preah Vihear and Koh Kong are regarded as remote, and are sparsely populated. Although together they form about 28% of the country's area, their total population of 280,000 people is only 2.6% of the country's with the density being a mere 6 persons/km². Most rural Cambodians are ethnic Khmer, with enclaves of Muslim Cham, Vietnamese and Chinese concentrated along river corridors.

3. Level of development: poverty, education and health

The Gross Domestic Product (GDP) per person and per year is of merely US\$ 250 which means that Cambodia ranks among the poorest countries in the world. Several methods have been proposed to assess the level of poverty within a given country. Using either 'direct calorie intake' methods or 'cost of basic needs' methods, it is clear that the poverty rate in Cambodia is relatively high. In fact it was estimated that 38% of all households live below the poverty line (WB, 1997). Indebtedness for basic food supplies is a common coping strategy employed by rural families in Cambodia, resulting in cycles of food deficits and a significant proportion of total family expenditures. In a recent survey conducted by UNICEF/WFP, it was found that on average 13% of monthly expenditures during the "lean season" of June were in debt repayment (UNICEF/WFP, 1998).

The 1998 Cambodia Human Development Report has reported that the Human Development Index (HDI) was 0.421 with a rural HDI of 0.433 and the urban one being 0.633 (MOP/UNDP, 1998). However, the Gender-related Development Index (GDI) for Cambodia is 0.427, which is mostly related to the higher average life expectancy for Cambodian women compared to men.

While the reasons for Cambodia's poverty are rooted partly in its historical and political contexts, poor service systems contribute to cycles of deprivation. While approximately 8% of the national budget in 1997 was reportedly committed to education, most school teachers do not receive regular salaries, and government contributions to a child's education is estimated at 25% while the household bears 75% of the burden (MOP/UNDP, 1998). Only 2.7% of children who enrol in primary school graduate from secondary school.

Health services are in a difficult transition from a former socialist system to quasi-private system. Mortality estimates are high and typical of low-income countries. Since 85% of the population is rural, the majority is affected by seasonality. Child morbidity, mainly due to diarrhoea, is also seasonal with higher incidence during the dry season. The infant mortality rate was 90‰ and the maternal mortality rate was estimated to be 473/100,000 in 1990. These rates together with an adult female illiteracy rate of 58% are the highest in the South East Asian region (MOP/UNDP, 1998).

4. Agricultural production, land use and food security

Cambodia is a predominantly agrarian society. The agricultural sector provides more than 40% of the gross domestic product. With 80% of the labour force employed in this sector, agriculture is the backbone of the Cambodian economy. Agricultural production has seen a steady increase in per capita and total volumes, punctuated by steep declines due to unfavourable weather conditions. Rice, primarily wet season rice, is the staple national crop,

followed by a variety of cash crops, including fruits, vegetables and rubber. Production is characterised by local variations largely based on farmers' abilities to control water during crucial times of the cultivation cycle. Ownership of land continues to be primarily single family plots which average 1.5 hectares in size.

The World Food Programme has been present in Cambodia since 1979. Between 1994 and 1997 WFP distributed 189,966 tons of food aid averaging 47,492 tons a year (WFP, 1997). The commitment under the current PRO was 66,890 tons, valued at 37.8 million dollars. Most food aid is in the form of rice, with some fish, oil and salt as well as nutrient-rich biscuits and blended food for emergency situations. From 1994 to 1997, 85% of WFP-provided commodities were distributed through village-based food for work in targeted areas (WFP, 1997).

The upward trend in the agricultural production was halted by war and social upheavals. Cereal production (mainly rice) did not improve until the late 1980's, as the result of land and agricultural reforms. There are definite seasonal fluctuations in food production and availability. The rice harvest begins in late November and early December and is usually completed by February. Therefore, the lean season begins around August until the first crops are harvested. Rice production suffered due to early floods and late drought in 1994, but this was followed by two consecutive years of surplus production (2.2, 3.3 and 3.4 million tons respectively in 1994, 1995 and 1996). Since 1996 total rice production has not undergone significant changes and has remained at about 3.4 million tons (FAOSTAT). Rice production always represented more than 97% of total cereal production which has increased from 2.6 to 3.5 million tons between 1990 and 1998 (FAOSTAT). Thus, while rice cultivation forms an important cultural and economic foundation for most rural families, such production has to be supplemented with other types of activities, primarily livestock production of cows, pigs and poultry. Total meat production has increased from 116 to 162 thousand tons in 1990 and 1998 respectively (FAOSTAT). In the same years, the production of milk has followed the same trend and has increased from 17 to 19.2 thousand tons. In Cambodia in 1998, the production of fruits and that of rubber has reached 300 and 43 thousand tons respectively (FAOSTAT).

Populations living in river corridors and in the flood plain of the Tonle Sap tend to rely on fish during times of lateral migration, and on a variety of cash crops. Populations in forest and scrublands rely more on day labour income and forest products.

Although national food production has increased in recent years, national food supplies are adequate but distribution problems remain among a significant proportion of the population (MOP/UNICEF, 1998). At the national level, profound weaknesses in the rice production system continue to cause structural food insecurity while at the local level there are many interfering factors which lead to acute or even chronic, food insecurity especially in rural areas. The result is the high levels of child and adult malnutrition found in the rural population.

5. Economy

After a period of rapid expansion in the national economy in the early 1990's, the country economy suffered a steep and enduring decline after a government shake-up in 1997, combined with a deep regional recession. This recent trend reflects longer term patterns in the country's economy. During the past three decades, the country's economy has been either under an international embargo, or artificially inflated by a sudden infusion of international assistance in the wake of the elections, which reached a peak of 518 million US dollars in 1996.

The economy, as measured by relative changes in GDP at constant 1993 prices, grew from 3.6% in 1993-94 to 6.8% in 1994-95 and prior to 1997 events had been estimated at 7% for 1997 (MOP/UNDP, 1998). The major sources of GDP growth have been industry (garment sector and small-scale industry) and the service sector, which have increased 10.8% and 7.6% respectively in 1996.

Overall, the economy is dominated by agricultural production, primarily rice. In 1996 it was estimated that 75% and 20.4% of the labour force was involved respectively with agriculture and with the service sector. Less than 5% of the labour force was involved with industry. These figures however, do not necessarily reflect rural livelihoods, which involve a diverse array of activities throughout the year.

II. THE FOOD AND NUTRITION SITUATION

1. Trends in energy requirements and energy supplies

Although the percentage of population in urban areas has almost doubled from 10.8% to 20.4% between 1965 and 1995, it remained relatively low (**Table 2**). This indicates that although urbanization is occurring, the pace remains slow, and is not expected to increase rapidly. This has implications for energy requirements, which are slightly higher for rural farming populations.

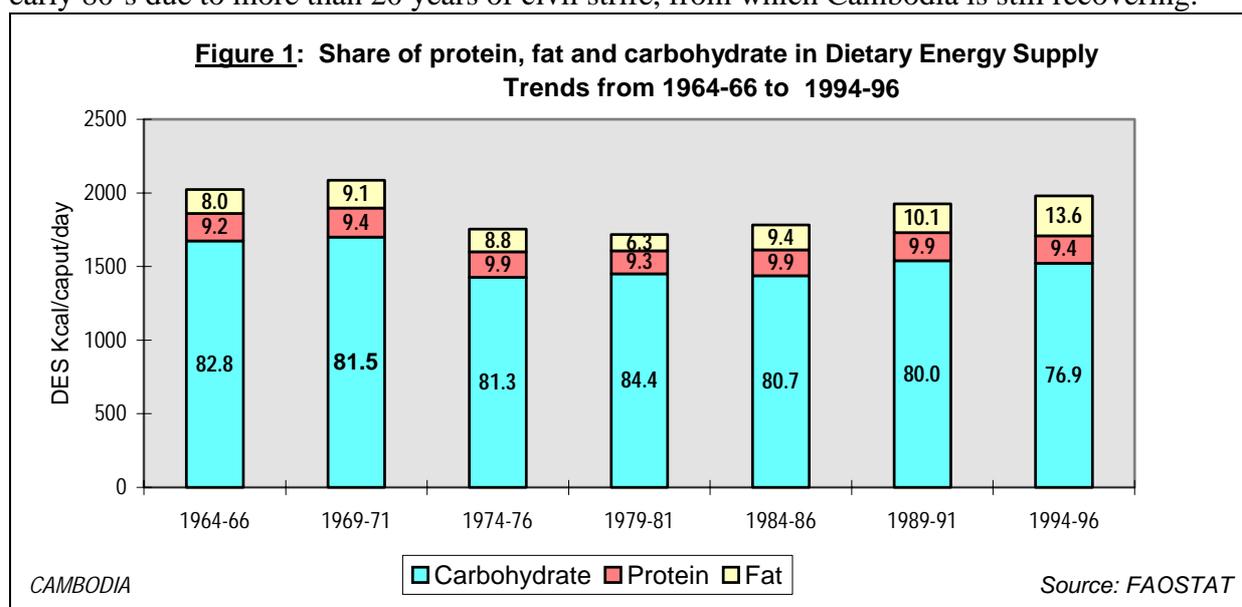
Since 1965, the dietary energy supplies (DES) have not been able to cover energy requirements, therefore indicating that a significant proportion of the population is probably lacking sufficient diet based on national food supplies. In fact, the FAO Sixth World Food Survey estimated that the DES did not cover the requirements of 29% of the population in 1990-92, compared to 13% in 1969-71, therefore indicating that the proportion of the population which is “undernourished” in terms of food inadequacy has increased (FAO, 1996).

Table 2: Total population, urbanisation, energy requirements and dietary energy supplies (DES) per person and per day in 1965, 1995 and 2025

Year	1965	1995	2025
Total population (<i>thousands</i>)	6141	10024	16990
Percentage urban (%)	10.8	20.4	39.5
Per caput energy requirements (<i>kcal/day</i>)	2145	2136	2212
Per caput DES (<i>kcal/day</i>)*	2022	1979	—

* Three-year average calculated for 1964-66 and 1994-96 (Source: FAOSTAT)

Figure 1 clearly shows the precipitous decline in food availability in the late 70’s and early 80’s due to more than 20 years of civil strife, from which Cambodia is still recovering.



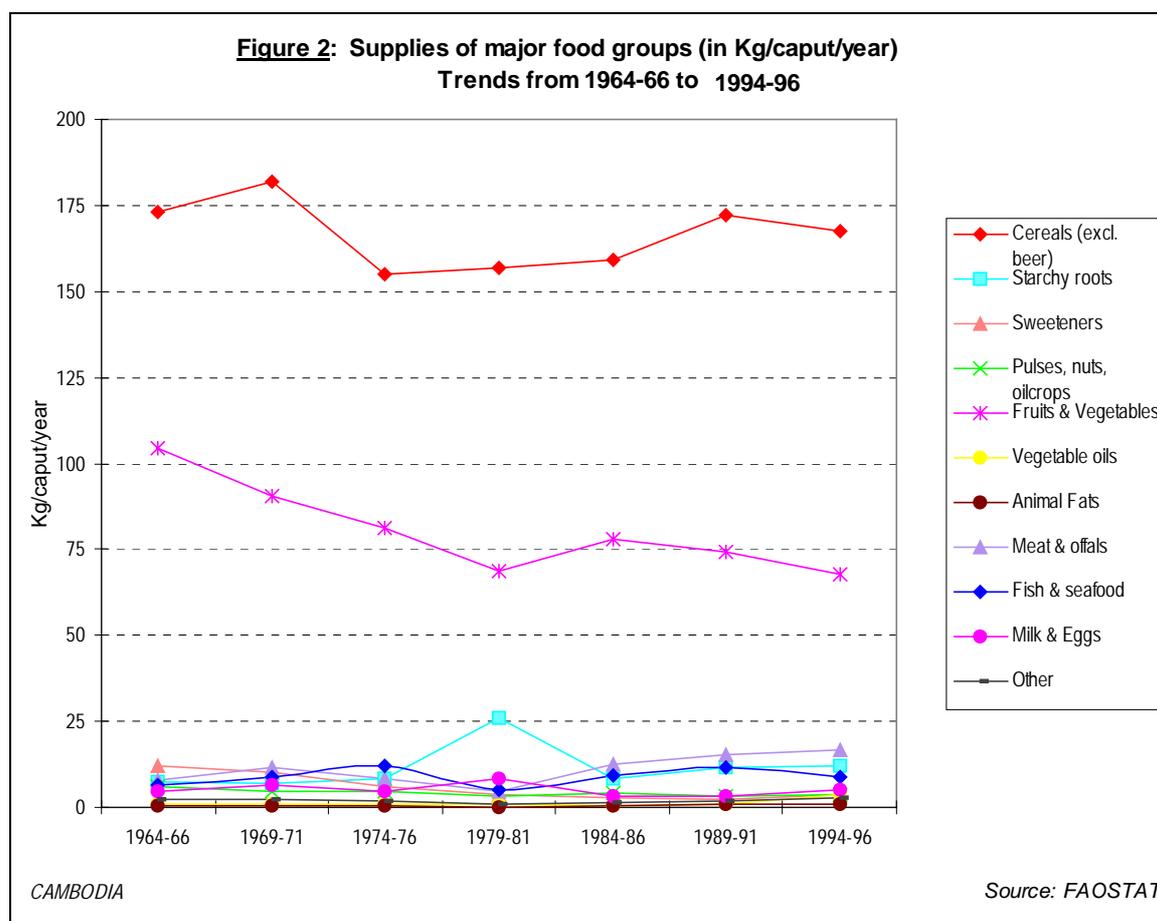
Since 1979-81 the DES have increased continuously from 1716 to 1979 kcal in 1994-96 and have probably improved further after. Based on data from food balance sheets, the majority of

Since 1979-81 the DES have increased continuously from 1716 to 1779 kcal in 1994-96 and have probably improved further after. Based on data from food balance sheets, the majority of energy supply is derived from carbohydrate which provided 77% of total energy in 1995 (**Figure 1**). Proteins and fat provided respectively 9% and 14% of the total energy supply (**Figure 1**). Although the share of energy supply from fat had almost doubled since 1964 it remains relatively low. Over the last 30 years, the share of total energy from carbohydrates has declined (from 83% to 77%) while the contribution of protein to overall energy supply has not changed. Increasing the share of energy supply from fat is crucial if overall energy requirements are to be met.

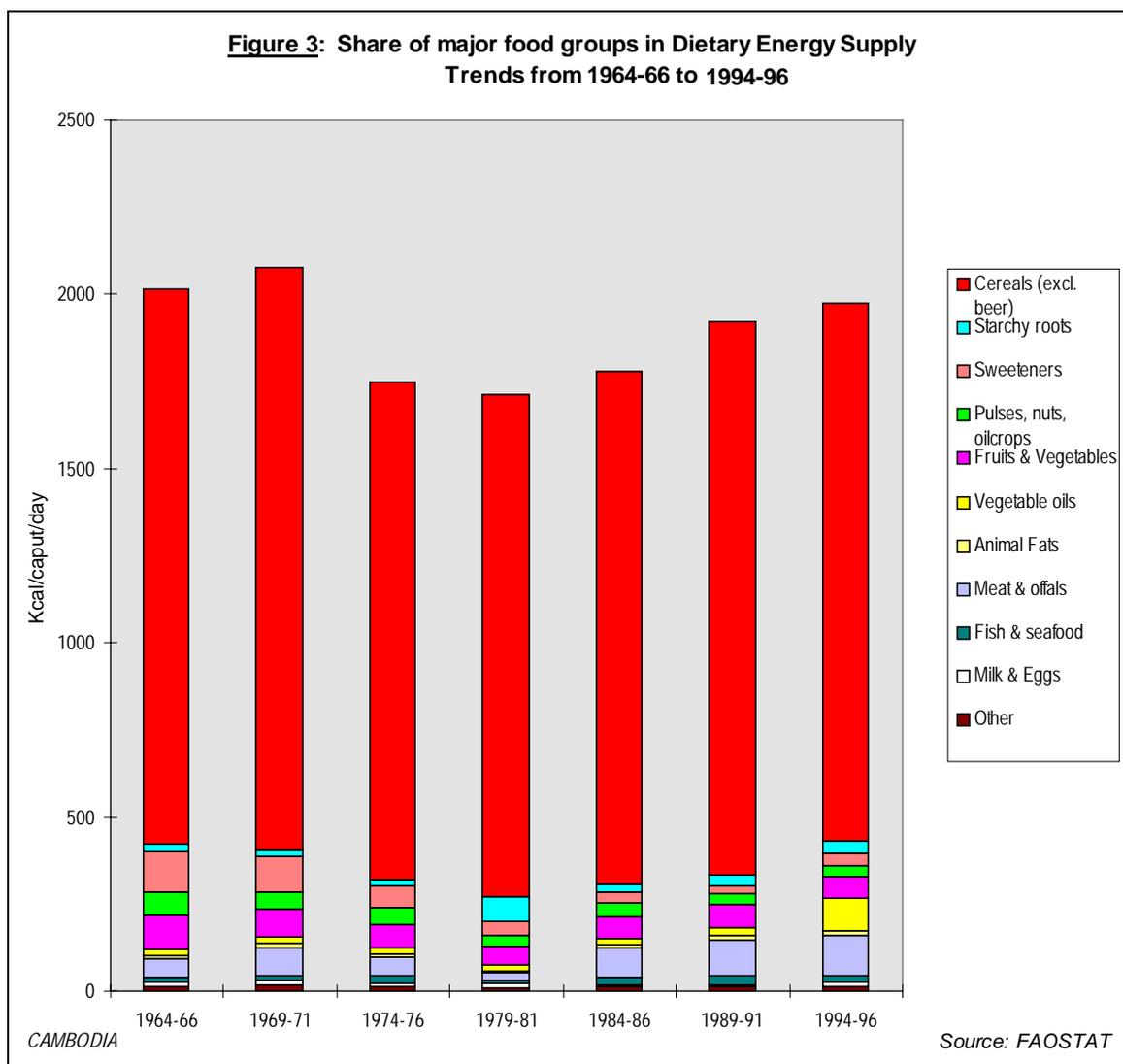
2. Trends in food supplies

Quantity: The trends in food availability and composition of food supplies in Cambodia are presented in **Figures 2-3**. These figures estimate the amount of food that is available to the population and not what has been consumed.

As shown in **Figure 2**, the supplies of major food groups have undergone significant changes over the past thirty years. Cereal availability have increased from 155-159 kg/caput/day in 1974-76-1984-86 to 168 kg/caput/day in 1994-96. Between 1979-81 and 1994-96 the supplies of starchy roots and milk&eggs have decreased respectively by 54% and 41% (**Figure 2**). In the same period, the supplies of fish&seafood and meat&offals have increased both from 5 kg/caput/year to respectively 9 and 17 kg/caput/year (**Figure 2**).



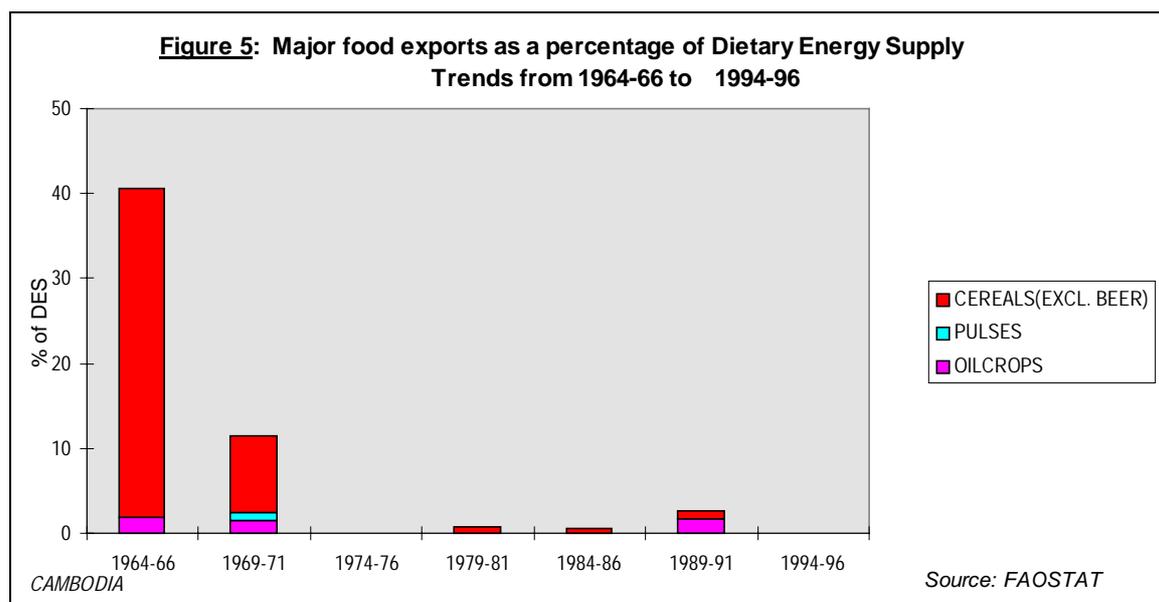
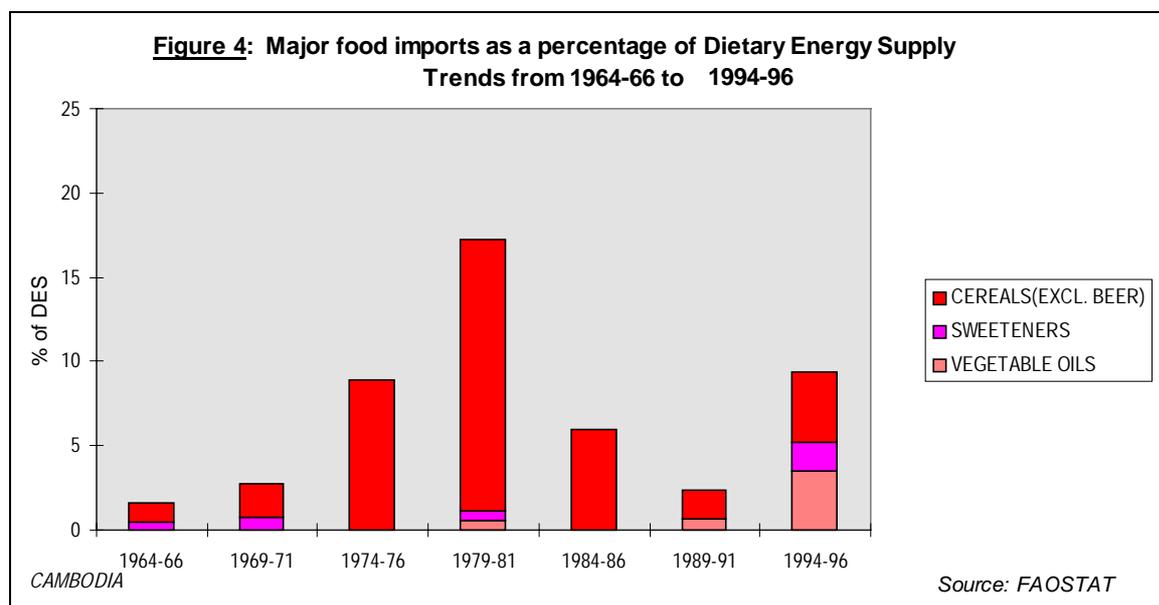
Energy: The relative contributions of major food groups in daily per caput energy supply are shown in **Figure 3**. The DES has increased from 1716 to 1979 kcal/caput/day between 1979-81 and 1994-96. Clearly, cereals represent the main source of energy in the Cambodian diet, providing 1,546 kcal/caput/day, equivalent to more than 78% of the total energy (**Figure 3**). The share of animal products in DES is 8% therefore indicating that the diet in Cambodia is mainly based on vegetable products which provide respectively, 92%, 80% and 59% of total energy, protein and fat supplies (**Figure 3**).



Major food imports and exports: Food imports as a percentage of DES have been irregular, and have undergone significant changes over the past thirty years. **Figure 4** clearly shows the increase of cereal imports in the late 1970's and early 1980's which represented more than 16% of DES in 1979-81. Since then, cereal imports have decreased and in 1994-96 they represented only 4% of DES. One significant pattern is the increase in the imports of vegetable oils and sweeteners which represent respectively 4% and 2% of DES.

Cambodia has been less competitive in the world food markets where the country has steadily been losing its position as a food exporter. In the last three decades, the exports of

cereals (mainly rice to Vietnam and Thailand) decreased from 39% to 0% of DES (**Figure 5**). The same trend was observed in the exports of oilcrops which have decreased from 2 to 0% of DES.



3. Food consumption

Regional, ethnic, cultural, income and agricultural production differences influence food consumption in Cambodia. Studies on food consumption patterns are limited, and consumption figures are usually based on food frequency surveys and food expenditure surveys. These surveys include: the Socio-Economic Survey of Cambodia (SESC) conducted in 1993/94, which detailed monthly expenditures for food groups, but provided no information on consumption or nutritional outcomes; the survey conducted by the Cambodia Development Research Institute (CDRI) in three villages, which included a 24-hour recall of food consumption, and the UNICEF/WFP survey which obtained consumption frequencies of certain food groups for children under 5 years of age (MOF/UNDP, 1995; CDRI, 1997; UNICEF/WFP, 1998).

From these surveys it emerged that the diet of the typical Cambodian consists primarily of rice with some fish products included. There is likely to be more consumption of animal products in the urban areas compared to the rural, where the main source of protein is *prahok*, which is fermented fish paste. Over the years the trend in energy consumption has been subject to political stability and ability to produce rice.

The dependence on rice in families' daily diets is on family production, on other food supplies in the vicinity such as corn, potato and cassava, and on income (to purchase rice when family supplies are exhausted).

The SESC survey reported that the daily average energy intake was 2,261 kcal, with important variations between rural and urban areas. Almost half of the sample consumed the equivalent of less than 2,100 kcal/caput/day, based on detailed expenditure lists (MOF/UNDP, 1995). **Table 3** shows the average daily per capita calorie intake in Rural and Urban areas by Expenditure Quintile for 1993-94. The level of calorie intake per capita across income strata is higher in rural areas (ranging from 2,135 calories for the poorest quintile to 2,659 calories for the richest quintile) than in urban areas (1,892 calories for the poorest 20 percent to 2,657 calories for the richest 20 percent). The table shows further that there is greater divergence across income groups in urban areas than in rural. It can also be observed that variance in the quantity of rice consumed by different socio-economic classes is almost negligible although the percentage contribution of rice to total energy intake decreases with the increase in income.

Table 3: Average daily per capita calorie intake in Rural and Urban areas by expenditure quintile (1993-94)

Quintiles	First Poorest	Second	Third	Fourth	Fifth Richest	all households
<u>Rural</u>						
total calories	2,135	2,150	2,379	2,326	2,659	2,330
calories from rice	1,621	1,578	1,705	1,645	1,738	1,664
<u>Urban</u>						
total calories	1,892	1,950	2,052	2,215	2,657	2,153
calories from rice	1,381	1,333	1,290	1,300	1,403	1,359

On average, calorie intake in Cambodia appears to be adequate in terms of the standard FAO norm except for the poorest 40 percent in the urban areas (MOF/UNDP, 1995). The issue of

food security is also relevant for small and landless farmers in Cambodia since only a few of them can produce food enough to last the whole year and most of them often have to endure rice deficits for a period of one to six months in a year. The “lean” months come between June and October or the stretch between planting time and the new harvest. While outright destitution is not widespread, a hard core group of between 5 to 15% of households can be described as facing food insecurity with another 15 to 20% managing to attain minimum consumption levels albeit at a high cost-indebtedness and recourse to risky coping strategies.

According to the UNICEF/WFP survey the average number of children meals was 2.4 meals/day. According to the CDRI survey which used 24-hour recall methodology, all meals involved rice. The composition showed a high reliance on rice over other food types. With regard to regional variations, there were no statistically significant differences in number of meals. With regard to other food types, fish was found to be by far the most common food type consumed in all regions.

In Cambodia, distinct geographic features help to define characteristics of the population and their food security status. These groupings are called **Food Economy Zones** and are defined as follows:

1) Lowland rain fed areas: The majority of the population living in these areas rely on a single non-irrigated wet season rice crop as a major food and income resource; on small independent land holdings; and income is supplemented by a variety of seasonal activities. The terrain is relatively flat and under extensive cultivation. There are 43 districts in these lowland areas with 3.34 million people.

2) Scrub/contract labour: The majority of people living in these areas rely mainly on degraded-forest resources and wage labour for income. The limited cultivation of rice is insufficient to meet annual needs. Landless households are commonly found in these areas. The population is vulnerable to reduction of forest resources through exploitation, and isolation from markets and major roads. These areas cover 28 districts with a population of approximately 1.8 million people.

3) Riverine: The majority of people living in these areas rely on cash crops, floating or dry season rice, fishing for food security and income. They reside next to major rivers or in communes adjoining the Tonle Sap in 29 districts and constitute approximately 2.6 million people.

4) Urban/Market: The majority of people living in this Food Economy Zone rely on cash income jobs and small business in urban government centres. These areas cover 18 districts with an estimated 1.6 million people.

5) Forest: The majority of people living in these areas rely mainly on forest products for food and income. These areas cover 29 districts with 585,800 people and are characterised by a relatively low population density (less than 8/km² persons).

6) Mixed: There are four distinct combinations of Food Economy Zones which are defined below.

Forest/Rice: Despite meeting the rain fed rice criteria, in 4 districts, with a population of 281,000 people, over 20 % of the assessed households report cutting logs for income.

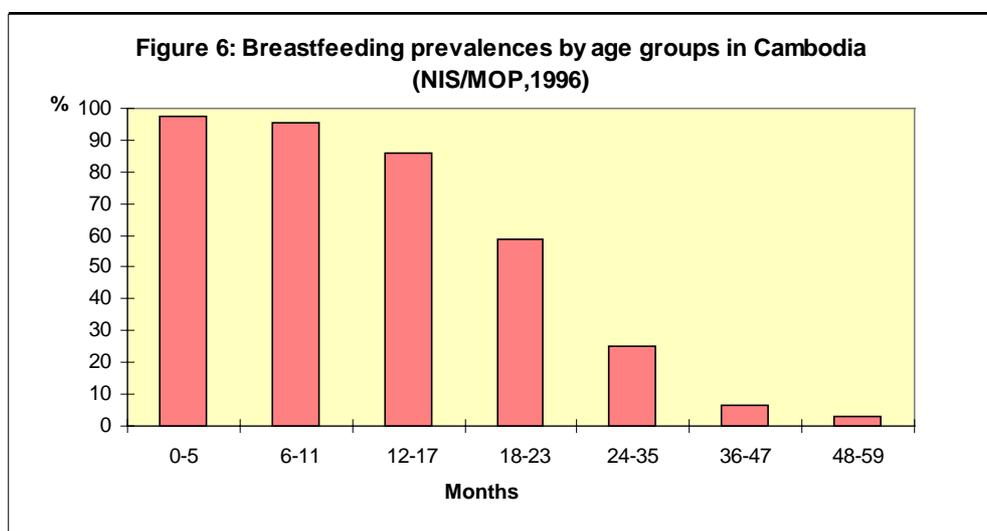
Forest/Riverine: In 7 districts with a population of 324,000 people, over 20% of the population are engaged with forest activities while over 75% meets the criteria of the Riverine Food Economy Zone.

Forest/Scrub: In 25 districts with a population of 821,000 people, families rely heavily on both degraded forests or scrub land in the vicinity of their villages, and on forest resources within their districts.

Unclear: In 3 districts with a population of 165,000 people, the households have no defined pattern of food security since these districts cover several different zones.

Breastfeeding

Breastfeeding is nearly universal in Cambodia (more than 96% in 1996) (NIS/MOP, 1996). A survey in Kampong Thom showed that slightly more than 30% of women begin breastfeeding within 12 hours of delivery (GTZ, 1997). The UNICEF/WFP baseline survey showed an average initiation period of 2 days after delivery and the knowledge of colostrum benefits was observed to be 43% (UNICEF/WFP, 1998). There are likely to be slight urban/rural differences in the breastfeeding practices, but usually duration of breastfeeding averages 16 months with the weaning period normally being at 24 months (NIS/MOP, 1996; UNICEF/WFP, 1998). There is little survey information available about intensity of breastfeeding and introduction of complementary weaning foods. However, it has been noted that although women often rely on breastfeeding even in the second year, weaning foods are introduced early (3-4 months) and are of poor quality (rice and water) (**Figure 6**).



4. Anthropometric data

The nutritional status of children under five is commonly assessed using three indices: weight-for-height (wasting) which reflects acute growth disturbances, height-for-age (stunting) which reflects long-term growth faltering and weight-for-age (underweight) which is a composite indicator of both long and short term effects. Weights and heights of children are compared with the reference standards (NCHS/CDC/WHO) and the prevalence of anthropometric deficits is usually expressed as the percentage of children below a specific cut-off point such as minus 2 standard deviations from the median value of the international reference data.

In 1996, a two round nationally representative Multiple Indicator Cluster Survey (MICS) was conducted as part of the Socio-Economic Survey of Cambodia (SESC). This survey was carried out by the National Institute of Statistics of the Ministry of Planning and sponsored by the Asian Development Bank in collaboration with UNICEF/UNDP/CARERE and ILO (NIS/MOP, 1996). The results of the survey provided the most recent and only nationally representative data available to evaluate the nutritional status of children in Cambodia (**Table 4a**).

Table 4a: Anthropometric data of children

Source/ Year of survey	Location	Sample			Percentage of malnutrition						
		Size Number	Sex	Age Years	Underweight		Stunting		Wasting		Overweight
					% Weight/Age < -3SD*	< -2SD	% Height/Age < -3SD*	< -2SD	% Weight/Height < -3SD*	< -2SD	% Weight/Height > +2SD
NIS/MOP, 1996	National	5188	M/F	6-59	17.5	52.4	30.8	56.4	2.7	13.0	4.3
MICS, 1996		2569	M	"	19.7	55.4	32.9	58.4	3.1	14.5	2.9
		2618	F	"	15.3	49.5	28.7	54.4	2.2	11.6	5.6
	<i>Provinces:</i>										
	Banteay Meanchey	182	M/F	6-59	12.6	41.2	25.6	54.9	1.7	10.1	6.8
	Battambang	323	"	"	14.6	48.6	28.0	56.1	3.1	12.1	1.6
	Kampong Cham	705	"	"	20.0	55.3	36.6	63.4	3.6	13.2	5.6
	Kampong Chhnang	216	"	"	19.4	50.5	21.0	55.1	1.4	13.9	0.0
	Kampong Spueu	146	"	"	34.2	60.3	39.8	69.9	6.2	12.3	11.6
	Kampong Thom	310	"	"	16.5	51.9	33.9	61.0	1.6	10.2	5.6
	Kampot	295	"	"	12.5	52.2	32.4	54.7	1.7	15.2	3.4
	Kandaal	544	"	"	22.4	59.9	32.6	55.5	3.3	14.8	4.4
	Kratie	126	"	"	11.9	46.0	17.6	55.2	1.6	15.2	3.2
	Phnom Penh	285	"	"	11.6	42.5	18.1	40.4	2.9	12.3	6.2
	Prey Veang	532	"	"	17.6	56.6	35.7	55.4	3.8	13.8	6.2
	Pursat	150	"	"	18.7	52.7	34.2	61.4	2.7	14.7	2.7
	Siem Reap	402	"	"	14.2	49.0	29.3	58.4	2.3	10.1	3.5
	Stung Treang	56	"	"	26.3	62.5	33.3	61.1	5.4	16.1	3.7
	Svaay Rieng	234	"	"	15.8	50.0	31.4	53.1	1.7	10.0	1.7
	Takeo	459	"	"	15.7	52.1	27.9	50.7	0.9	13.5	3.1
UNICEF/WFP, 1998	Rural areas	1555	M/F	6-59	17.1	60.9	18.4	48.5	1.7	19.8	...
Baseline Survey, 1998	"	762	M	"	16.6	61.3	18.3	48.9	1.8	21.8	...
	"	793	F	"	17.7	60.5	18.5	48.0	1.5	17.9	...
	<i>Food Economies:</i>										
	Lowland Rice	757	M/F	6-59	15.5	58.3	17.2	45.8	1.1	18.2	...
	Scrub	469	"	"	18.7	63.1	18.2	49.4	2.6	19.9	...
	Riverine	84	"	"	19.0	66.7	21.4	58.3	1.2	20.2	...
	Forest	79	"	"	19.0	65.8	21.5	53.2	2.5	26.6	...
	Mixed	167	"	"	18.6	61.7	21.2	50.9	1.8	23.4	...

Notes: ... no data available.

Each index is expressed in terms of the number of standard deviation (SD) units from the median of the NCHS/CDC/WHO international reference population. -2SD includes children who are below -3 SD.

Food Economy zones are defined above in Food Consumption.

According to the findings of the MICS survey, malnutrition in children 6-59 months old continues to be a major problem in Cambodia based on the three commonly used indicators. The prevalence of underweight was 52%, that of stunting was 56% and 13% of children were wasted (NIS/MOP, 1996) (**Table 4a**). According to the WHO classification of child malnutrition, a prevalence of underweight above 30% or stunting above 40% is considered very high while a prevalence of wasting above 10% reflects a serious public health problem (WHO, 1995). Although all provinces were affected by child malnutrition there were important provincial differences in the prevalence of the three anthropometric indicators. The prevalence of underweight ranged from 41.2% in Banteay Meanchey to 62.5% in Stung Treang which also showed the highest prevalence wasting (16.1%) (**Maps 2, 3 and 4** and **Table 4a**). The prevalence of stunting ranged from 40.4% in Phnom Penh to 69.9% in Kampong Spueu. The prevalence of underweight, stunting and wasting were found to be higher in boys, therefore indicating that girls had a better nutritional status (**Table 4a**). A tendency of overweight was also observed in many provinces but Kampong Spueu was found to be the most affected (**Map 5**).

The results of a survey conducted by UNICEF/WFP in 124 villages in their rural programme areas are presented by Food Economy Zone in **Table 4a** (UNICEF/WFP, 1998). The prevalence of underweight was 61%, that of stunting was 49% and 20% of children 6-59 months old were wasted (**Table 4a**). Children from the Riverine and Forest food economy zones are the most likely to be malnourished, as indicated by the prevalence of underweight and stunting which was above 65% and 53% respectively.

In Cambodia, the immediate causes of malnutrition in children are low food intake and chronic illness which are mutually reinforcing. Lack of food makes the body more susceptible to diseases, which decreases appetite and increases the body's need for food. Underlying causes of malnutrition in Cambodian children are related to household level food insecurity, inadequate care of children and women, and poor access to health care services, clean water and sanitation.

The nutritional status of adults is usually assessed using the Body Mass Index (BMI) calculated as weight (kg) over height squared (m^2). Adults with a BMI less than 18.5 kg/m^2 are considered to suffer from chronic energy deficiency. A BMI of over 25.0 kg/m^2 indicates overweight.

Table 4b: Anthropometric data of adults

Source/ Year of survey	Location	Sample			Percentage of malnutrition							
		Size Number	Sex	Age Years	Body Mass Index (kg/m^2)			Chronic Energy Deficiency % BMI			Overweight % BMI	Obesity % BMI
					mean	SD	median	<16.0	16.0-16.9	17.0-18.5<	25.0-29.9	>30.0
UNICEF/WFP, 1998	Rural areas	1109	F	15-49	19.9	2.3	19.7	2.2	5.8	20.7	2.3	0.3
1998	<i>Food Economy:</i>											
	Lowland Rice	544	F	15-49	19.8	2.1	19.7	1.5	5.1	21.9	2.2	0.0
	Scrub	335	"	15-49	20.3	2.4	20.0	1.2	4.2	17.3	3.0	0.3
	Riverine	53	"	15-49	20.7	2.9	20.4	1.9	5.7	11.3	3.8	3.8
	Forest	55	"	15-49	18.3	2.1	18.4	12.7	14.5	32.7	0.0	0.0
	Mixed	122	"	15-49	19.5	2.3	19.4	3.3	9.0	23.8	1.6	0.0

Notes: ... data not available

In the UNICEF/WFP survey nearly 3000 non-pregnant women were measured. The results are presented by Food Economy Zone (**Table 4b**) (UNICEF/WFP, 1998). According to this survey, the prevalence of women 15 to 49 years old with a BMI < 18.5 kg/m² was 28.5%. As for children, the analysis by food economy zone showed that women in the forest were the most affected by CED with 60% having a BMI < 18.5 kg/m².

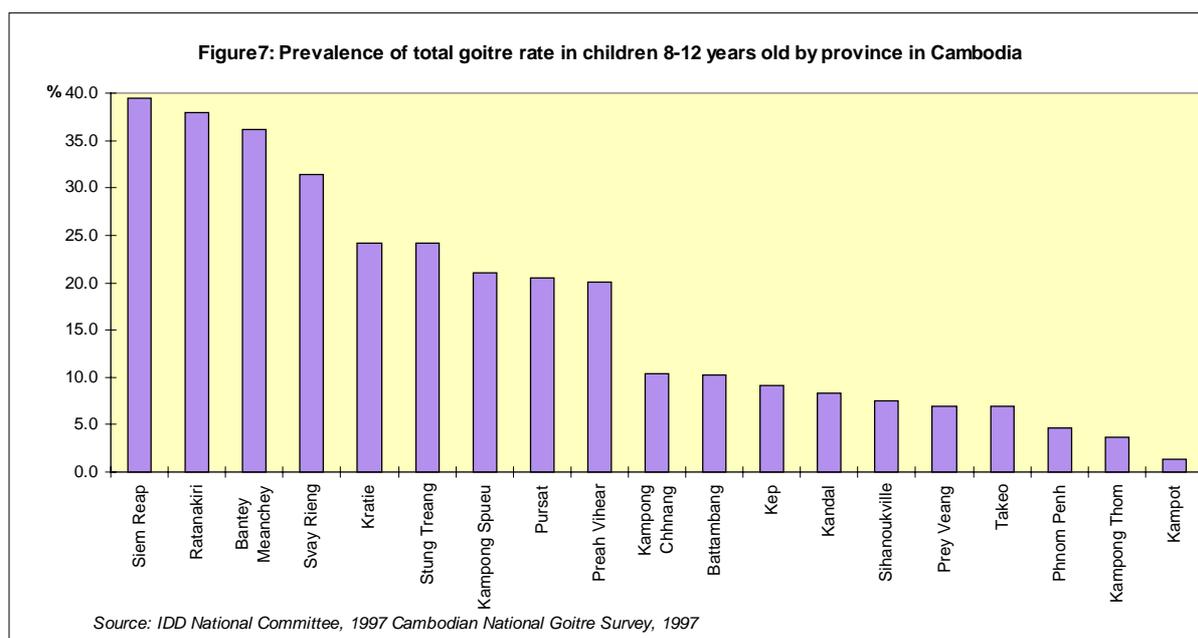
5. Micronutrient deficiencies

Iodine Deficiency Disorders (IDD)

Iodine deficiency disorders (IDD) include the clinical and subclinical manifestations of iodine deficiency. Iodine deficiency in pregnant women may cause irreversible brain damage in the developing foetus, whereas in infants and young children it may cause brain damage, psychomotor retardation and intellectual impairment.

It was estimated that there are nearly 1.3 million individuals at risk of IDD in Cambodia. Therefore IDD poses a mild to moderate public health problem for the country. There is a plan for universal salt iodization to begin in 1999 with support from UNICEF and HKI along with the government of Cambodia. The support of WHO should also be mentioned it includes the provision of 8 salt iodization machines and potassium iodate as well as the technical assistance in the production of iodised salt and in the marketing of its product.

The IDD National Committee conducted the first nationally representative goitre survey in 1997 (IDD National Committee, 1997). The national average total goitre rate was 12% in school children aged 8 to 12 years. However, there were significant provincial differences ranging from 1.3% to 39.4% in Kampot and Siem Reap, respectively (**Table 5**). The provinces of Siem Reap, Ratanakiri, Banteay Meanchey and Svay Rieng were found to have severe IDD problems with more than 30% of children 8-12 years old affected. Some areas showed a total goitre rate in the same age group above 45 percent.



Vitamin A Deficiency (VAD)

Vitamin A is an essential micronutrient required for normal health and survival and has four major roles in the body: vision, epithelial cell growth and maintenance, immune function and growth and development. Children under 3 years of age and pregnant and lactating women are the most at-risk of vitamin A deficiency.

Vitamin A deficiency has been a long recognized problem in Cambodia as indicated by the presence of a local term, *khwak Meann*, for night blindness. As with most other health and nutrition indices, there is a lack of data to determine trends in prevalence rates of Vitamin A deficiency. Rates of night blindness in children have been reported to range from 3 to 12 % at different times and in various communities. In the UNICEF/WFP baseline survey of rural communities, mothers reported suffering from night blindness in nearly 10% of all pregnancies (UNICEF/WFP, 1998). In the same survey, 3.6% of children (24-59 months) were reported to have suffered from night blindness (**Table 5**). Vitamin A capsule distribution reached only about 55% of all eligible children (over 5 months of age). The consumption of Vitamin A-rich foods (fruits and vegetables) is low in most areas.

Table 5: Surveys on micronutrient deficiencies

Source/ Year of survey	Deficiency	Location	Sample			Percentage
			Size Number	Sex	Age Years	
Iodine						
IDD National Committee, 1997	Total Goitre Rate	National	35418	M/F	8 to 12	12.0
NGS, 1997		<u>Provinces:</u>				
		Bantey Meanchey	1800	M/F	8 to 12	36.2
		Battambang	1800	"	"	10.2
		Kampong Chhnang	1813	"	"	10.4
		Kampong Thom	1799	"	"	3.7
		Kampong Spueu	1802	"	"	21.0
		Kampot	1920	"	"	1.3
		Kandal	1940	"	"	8.3
		Kep	1799	"	"	9.2
		Kratie	3053	"	"	24.2
		Phnom Penh	1920	"	"	4.6
		Preah Vihear	1600	"	"	20.1
		Prey Veang	1600	"	"	7.0
		Pursat	1800	"	"	20.5
		Ratanakiri	1123	"	"	37.9
		Siem Reap	1924	"	"	39.4
		Sihanoukville	1802	"	"	7.5
		Stung Treang	2251	"	"	24.1
		Svay Rieng	1800	"	"	31.4
		Takeo	1872	"	"	6.9
Vitamin A						
UNICEF/WFP, 1998	Night blindness	14 rural provinces	907	M/F	2-5	3.6
Baseline Survey, 1998	"	"	1755	F*	15-49	9.9
Iron						
UNICEF, 1982	Hb < 11.0 g/dl	National		M/F	Months 5-59	60.0
NSFIS, 1982	Hb < 12.0 g/dl	"		F	15 to 49	40.0
UNICEF/WFP, 1998	Hb < 12.0 g/dl	8 rural provinces	994	F	15 to 49	69.0
Baseline Survey, 1998	Hb < 11.0 g/dl	"	97	F*	15 to 49	74.0
	"	"	1348	M/F	5-59	82.0
<u>Food Economies:</u>						
UNICEF/WFP, 1998	Hb < 11.0 g/dl	Lowland Rice	761	M/F	Months 5-59	81.0
Baseline Survey, 1998	"	Scrub	469	"	"	82.0
	"	Riverine	84	"	"	79.0
	"	Forest	79	"	"	90.0
	"	Mixed	168	"	"	84.0

Notes: ... data not available F*: pregnant women

Anaemia/Iron Deficiency (IDA)

The consequences of Iron Deficiency Anaemia (IDA) include reduced physical work capacity and productivity, impaired cognitive functions and brain metabolism and reduced immunocompetence. The causes of IDA include low dietary intake in relation to the Recommended Dietary Allowances (RDA), poor bio-availability of iron in the diet and high prevalence of parasitic infestations.

Until 1998, there had never been any broad-based work to assess levels of IDA in Cambodia. The UNICEF/WFP baseline survey collected haemoglobin levels for more than 1,348 children and 1,000 mothers from a random sample of rural villagers (UNICEF/WFP, 1998). Based on the WHO cut off point for haemoglobin concentration of 11.0 g/dl, the overall rates of anaemia in children 6-59 months were high at 82% while 69% of non-pregnant mothers (n=994) were classified as anaemic (Hb<12.0 g/dl) (**Table 5**). For pregnant women (n=97), 74% were reported to be anaemic (Hb<11.0 g/dl). The prevalence of anaemia decreased with increasing age of children. There is no information on the contribution of worm or malaria infections to these anaemia rates. However, in the study it was found that children who were classified as anaemic consumed significantly less protein from animal origin on a regular basis. These facts point to the lack of dietary diversity as being a prime cause of anaemia in Cambodia. For the mothers, BMI and hematic haemoglobin concentration were often inversely related which alludes to the fact that a high-calorie diet of rice increases the BMI, but that a low-calorie and more diversified diet results in higher haemoglobin levels.

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- | <i>Source:</i> | <i>Indicator:</i> |
|---------------------------|--------------------------------|
| FAOSTAT. 1997 | A.1-2, B, C.10-11, E.1-3, F, G |
| UN. 1996/1997 | C.1-9, D.5 |
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| FAO. 1996. | H |