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A Poverty Profile of Cambodia

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Washington, D.C.*

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FOREWORD

Since 1993 the Royal Government of Cambodia has made important strides in reestablishing political and economic stability. These achievements are impressive given the suffering that the country and its people experienced during the past quarter of a century. Most people still lack access to health and education facilities, potable water, electricity and serviceable roads. The country's natural and productive capital have suffered great losses. Land mines render large portions of valuable agricultural land unuseable, and pose a serious threat to people. But perhaps Cambodia's greatest loss was the depletion of its human capital by mass genocide and large-scale exodus of the most educated citizens during the years of Khmer Rouge rule from 1975 to 1979 when institutions were dismantled, the legal system destroyed and money abolished.

With this legacy of suffering and devastation Cambodia is now one of the poorest countries in the world with a per capita income of only US\$ 260. Achieving rapid poverty reduction is therefore a central goal of Cambodia's First Socioeconomic Development Plan, 1996-2000. Better and up-to-date information about the poor is needed to assist the government in designing effective policies for attacking poverty to achieve this goal. Who are the poor? How many poor are there? Where do they live? What are their sources of income? Answering such basic policy questions on poverty requires a systematic information base on the distribution of living standards. This paper constructs a consistent nationwide poverty profile to support the government's effort to strengthen the design of poverty reduction policies. The poverty profile is based on the first Socioeconomic Survey of Cambodia (SESC) carried out in 1993/94 by the National Institute of Statistics, Ministry of Planning and cosponsored by the Asian Development Bank and the United Nations Development Programme. The SESC represents the first large-scale national household survey of living standards undertaken in Cambodia, although complete coverage of rural areas was not feasible because of security risks. As such it marks an important contribution to development of the information base for better poverty analysis and policy in Cambodia.

Cambodia's poverty profile for 1993/94 provides policy-oriented poverty comparisons which can be used to help target anti-poverty programs, to make international comparisons of poverty incidence, and to set a baseline for future monitoring of Cambodia's development progress over time. Publication of this paper makes available the methodology and results to stimulate discussion and comment on Cambodia's poverty reduction agenda within the development community.

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Note: Unless otherwise noted, the data sources for Tables and Figures are the authors' compilations based on the SESC 1993/94

ABSTRACT

This paper uses the Socioeconomic Survey of Cambodia (SESC) of 1993/94 to estimate poverty measures for Cambodia. The SESC was administered over four rounds to 5,578 households in three domains: Phnom Phen, Other Urban and Rural areas. The paper begins by describing the SESC questionnaire and sampling frame to help interpret representativeness of the empirical results because not all areas of Cambodia could be included in the sampling frame. Basic data are given on the level and distribution of living standards as measured by per capita household consumption expenditures. New poverty lines for Cambodia are estimated and used to make poverty comparisons for targeting purposes -- assessing differences among regions, sectors of employment, levels of education, gender and household size -- and to make international comparisons between Cambodia and other countries in East Asia. These consumption-based poverty comparisons are supplemented with an assessment of the distribution of various nonmonetary welfare indicators between the poor and the better off in Cambodia. The paper concludes with recommendations for improving institutional capacity for poverty analysis and poverty in Cambodia.

EXECUTIVE SUMMARY

Key Issues in Poverty Analysis and Policy

Poverty Reduction. Poverty reduction is a central goal of Cambodia's First Socioeconomic Development Plan, 1996-2000. Better and up-to-date information about the poor is essential to assist the Government in designing effective policies for attacking poverty. Who are the poor? How many poor are there? Where do they live? What are their sources of income? Policies intended to help the poor cannot succeed unless the Government knows who the poor are and how they are likely to respond to public interventions. This report takes an initial step towards answering these questions, and sets out an approach to developing the household survey information base for future poverty monitoring and assessment in Cambodia.

Poverty Profile. Answering basic policy questions on poverty requires a systematic information base on the distribution of living standards in Cambodia. This report constructs a consistent nationwide poverty profile to support the Government's effort to strengthen the design and targeting of poverty reduction policies during implementation of the First Development Plan. This poverty profile is based on the first Socio-Economic Survey of Cambodia (SESC) carried out in 1993/94 by the Ministry of Planning, National Institute of Statistics and cosponsored by the Asian Development Bank and the United Nations Development Programme. The SESC represents the first large-scale national household survey of living standards undertaken in Cambodia, although complete coverage of rural areas was not feasible. As such it marks a historic contribution to development of the information base necessary to support better poverty analysis and policy.

Poverty Comparisons. This poverty profile is used to make policy-oriented poverty comparisons which can be used to help target antipoverty programs, to make international comparisons, and to set a baseline for future monitoring of development progress over time. Is poverty higher among certain population groups—such as rural areas, remote regions, ethnic minorities--than others? Is poverty lower in Cambodia than its neighboring countries? Has poverty decreased over time? Setting a poverty line is a prerequisite for measuring poverty in order to make these poverty comparisons.

Poverty Line. Unlike most of its neighboring countries, the Royal Government of Cambodia has not yet established an official poverty line. This report sets new region-specific poverty lines for Cambodia based on standard analytical methods used by the World Bank in constructing poverty estimates for neighboring countries. These poverty lines are based on a benchmark per capita calorie requirement of 2,100 calories per day. The composition of the underlying food bundle is chosen to represent typical consumption patterns in Cambodia. The regional poverty lines take into account geographic price variations in the cost of the same food basket in different parts of the country. The resulting poverty lines in 1993/94 are 1,578 Riels per person per day in

Phnom Penh, 1,264 Riels per person per day living in Other Urban areas, and 1,117 Riels per person per day in Rural areas.

Poverty Indexes. Comparing these poverty lines with the individual distribution of per capita consumption expenditure reported in the SESC data provides the basis for measuring the poverty indexes which are used in making poverty comparisons. The most commonly used index of poverty is simply the proportion of the population whose expenditure levels fall below the poverty line, often called the head-count index.

Poverty Comparisons for Targeting

Regional Targeting. Targeting the design and placement of antipoverty programs is essential to reach disadvantaged groups and backward areas effectively and efficiently. Probably the most important use of the poverty profile is to support efforts to target development resources towards poorer areas, aiming to reduce aggregate poverty through regional targeting. Which regions should command priority in targeting? This question can only be answered at a highly aggregated level by the SESC because of the limited number of geographic domains which were sampled. The survey only supports regional comparisons between Phnom Penh, Other Urban and Rural areas. While this provides a broad sense of the appropriate policy orientation in regional targeting, it is obviously of limited practical value for choosing the geographic placement of project interventions.

Looking first at the incidence of poverty in different areas, the regional poverty profile shows that rural poverty is higher than urban poverty. The incidence of rural poverty averages 43 percent -four times higher than the 11 percent poverty incidence found in Phnom Penh, and significantly higher than the 36 percent poor in Other Urban areas.

Looking instead at the magnitude of regional contributions to national poverty – which take into account differences in the group's relative share of the national population, as well as differences in the incidence of poverty – shows that at least 85 percent of all the poor are concentrated in rural areas. Government policies to reduce poverty must, therefore, focus primarily on rural areas where the vast majority of the poor live.

Employment Targeting. The ability of the vast majority of households in Cambodia to escape poverty will depend on their earnings from employment. Thus it is important to examine the relationship between poverty and the types of employment of working-age household members. The most important income-earner is usually the head of household. Looking first at the distribution of poverty incidence, the highest poverty rate--46 percent--is found among people living in households headed by farmers. By contrast, households headed by someone working in the government are least likely to be poor: in these occupations the poverty rate is only 20 percent. Clearly policies which aim

at reducing poverty through enhancing income generating capabilities should be targeted towards the agricultural sector.

Turning to the contributions made to national poverty, the strongest policy message for targeting purposes is that more than three-quarters of the poor are found among households in which the head has an agricultural occupation. This reflects both the high proportion of people living in agricultural households and their above average poverty rate. This means that policies to reduce poverty in Cambodia must reach agricultural households if any major reduction in poverty is to be achieved -- any policy that misses the farmers will bypass around 75% of the poor. By contrast, households in which the head works for the formal public or private sectors account for less than 10% of overall poverty. Moreover, households headed by government workers account for only 3 percent of national poverty. In other words, policies that focus on employee conditions –particularly civil servants--will miss more than 90% of the poor in Cambodia.

Education Targeting. The relationship between poverty and education is particularly important because of the key role played by education in raising economic growth and reducing poverty. The better educated have higher incomes and thus are much less likely to be poor. Cambodians living in households with an uneducated head are more likely to be poor, with a poverty rate of 47 percent. But at higher levels of education, the likelihood of being poor falls considerably. The prevalence of poverty among households in which the head has completed secondary education falls to around 30 percent.

Raising educational attainment is clearly a high priority in order to improve living standards and reduce poverty –at present around three-quarters of all the poor live in households headed by somebody who has either completed only primary school (44 percent) or has no education at all (28 percent).

Gender Targeting. The status of women, who in most developing countries are disadvantaged in comparison with men, is an important policy concern. One indicator of the gender gap is whether female-headed households are worse off than those headed by males. This might be expected to be a major concern in Cambodia since nearly one-quarter of the population live in households headed by women. In fact, the SESC data show that female-headed households in Cambodia are *less* likely to be poor than male-headed households. The incidence of poverty averages only 35 percent in female-headed households, compared to 40 percent in male-headed households.

Although people living in female-headed households account for nearly 23 percent of the population, they account for only about 15 percent of all the poor in Cambodia. Overall, it does not appear to be the case that female-headed households are generally more vulnerable to poverty than those headed by males; in fact the opposite seems to be the case. In this respect gender and poverty patterns by household headship are similar to those observed in other East Asian countries such as Vietnam and Indonesia.

International Poverty Comparisons

Is Cambodia poorer or better off than other East Asian countries in terms of the proportion of the total population living in poverty? Reliable comparisons between Cambodia and other countries cannot be made at the national level because a large part of the country was excluded from the SESC sample frame. Nevertheless it is possible to compare the regional poverty estimates for Cambodian with corresponding estimates from other countries for which poverty estimates have been made using comparable methodology.

These comparisons suggest that the incidence of rural poverty in Cambodia (43 percent) is lower than among its Indochina comparators --Vietnam (47 percent) and Laos (53 percent). But rural poverty in Cambodia remains considerably higher than elsewhere in East Asia, taking Indonesia as an example (24 percent). However it must be borne in mind that rural poverty in Cambodia may have been underestimated by the exclusion of significant portions of the countryside from the SESC sample. On the other hand, urban poverty appears to be slightly higher in Cambodia (24 percent) than among its Indochina neighbors --Vietnam (20 percent) or Laos (24 percent)—and much higher than Indonesia (10 percent). These international comparisons emphasise the magnitude of the development gap which remains to be closed between the economies of Indochina and the rest of East Asia, while suggesting that Cambodia's starting point is not very different from its neighbors in Indochina.

Poverty Estimates in the Plan

The First SocioEconomic Development Plan reports official estimates of poverty in Cambodia. These estimates were constructed using summary tabulations of the household expenditure distribution from the SESC 1993/94. This report revises these preliminary estimates by using the detailed individual records from the full SESC dataset. The revised estimates are significantly different:

- the revised poverty line for Phnom Penh is 25% lower, while the revised poverty lines are similar in both the Other Urban and Rural areas.
- the revised poverty rate for Phnom Penh is lower, while the revised poverty estimates for Other Urban and Rural areas are much higher.

The lower poverty estimate for Phnom Penh is primarily due to differences in the poverty line, which in turn results from the relatively high allowance for nonfood consumption incorporated in the Plan estimates compared to this report. On the other hand the large difference in the poverty estimates for Other Urban and Rural areas is almost completely driven by the difference in the ranking method. In this case, ranking the distribution of households on the basis of total household consumption in constructing the preliminary estimates in the Plan--instead of ranking household members by per capita consumption--turned out to be an unfortunate approximation.

Institutionalising Poverty Analysis and Policy

Constraints. The policy relevance of the poverty profile for Cambodia based on SESC 1993/94 illustrates the importance of adequate data from large-scale household surveys in analyzing poverty and designing appropriate policies to translate the Government's commitment to poverty reduction into action. Three significant limitations will need to be overcome in future development of the information base on living standards in Cambodia:

The first is that the SESC was not designed to be a fully integrated **multipurpose** survey of the type needed to conduct a comprehensive poverty assessment for policymakers. For example, while the expenditure data collected by SESC 1993/94 generate a detailed picture of the distribution of per capita consumption, it is not possible to analyse levels or determinants of access to social services among the poor because the survey did not simultaneously collect data on education enrollments or utilisation of health services, nor did it collect data on the price of obtaining access to these services. The ongoing SESC 1996 goes to the other extreme. While extensive data are collected on nonmonetary indicators such as child nutrition or immunisation coverage, only limited information will be collected on household consumption expenditure so that interrelations with poverty status may not be clearly identified.

Second, the SESC is not able to support nationwide geographic **disaggregations** of key variables such as per capita expenditure and poverty incidence at the provincial level. This imposes an important practical limitation on its potential use in project planning. The need to overcome similar limitations in other countries have led to the adoption of much larger sample sizes. For example, the annual core household survey in Indonesia is now administered to over 200,000 households. Similarly, Vietnam now uses a sample of 45,000 households for the annual multipurpose survey. These enhancements are intended to provide much finer identification of the geographic location of poverty problems, support the design of more efficiently targeted poverty alleviation programs and strengthen capacity for decentralized planning at the provincial level.

Third, the SESC surveys have not yet been **institutionalized** as part of a systematic, long-term and regular effort to evaluate the extent and nature of the poverty problem in Cambodia, to monitor progress in poverty reduction over time, and to evaluate the effectiveness of specific targeted antipoverty interventions. This means there is a risk that the potential benefits of these surveys will be short-lived. If the investments which have been made in creating new skills in survey design, field procedures, data processing methods, policy analysis and program design are not maintained continuously then future surveys will become much more difficult to implement.

Agenda for Institutional Strengthening. The importance of consolidating and sustaining these nascent efforts to strengthen the information base for policymaking on poverty is increasingly recognized in neighbouring countries. For example, in the early

1990s Indonesia initiated a major collaborative effort between the planning and statistics agencies to redesign its national household survey system (SUSENAS) to provide better data to guide the country's poverty alleviation programs. China is planning to set up a Poverty Monitoring and Evaluation System with the same objective. Recently Vietnam introduced an annual series of large-scale multipurpose household surveys of living standards. The agenda for institutionalizing poverty analysis and policy in Cambodia embraces four key elements.

First, the government should consider adopting routine implementation of a new national household survey which offers both multipurpose coverage and geographic disaggregation. This calls for a two-part "**core/module**" household survey design.

The purposes of the core are to support **monitoring** of changes in key indicators over time, and identification of priority areas for geographic targeting of development programs. To serve these needs, the contents of the core questionnaire could be fixed on a small number of key welfare indicators, e.g. per capita consumption, education enrollment, health care utilization rates, and the questionnaire would be implemented relatively frequently -- probably every year -- on a large sample so as to give estimates of the indicators disaggregated at least to provincial level. At the same time the core could be supplemented every year with a rotating sector module.

The purpose of the modules would be to support in-depth **analysis** of sectoral issues and policies, such as the effects on the poor of changing pricing policies in the social sectors. Given the focus of the modules on analysis rather than monitoring, individual sector modules need not be carried out every year or on a large sample. Instead they could rotate over a 3 year cycle on a subsample of the core -- for example, a social sector module, followed by an income and employment module, and then a detailed consumption module.

The core/module survey of households needs to be linked to a **community survey** conducted at the village level. The purpose of the community survey is to collect data on variables which affect all households in the community, such as public/private provision of economic infrastructure (e.g. land, irrigation, agricultural extension, roads and markets) and social services (e.g. availability and quality of schools and health services). Thus the community survey plays an essential role in analysing determinants of household behavior and welfare based on merged datasets using the community and household data. Ultimately the community survey can also play a role in poverty monitoring for targeting purposes. This requires implementation of the community survey on a census basis. For example, in 1993 the government of Indonesia prepared a nationwide poverty map identifying poor villages based on data collected in the community survey (Potensi Desa or PODES) which is administered to all villages every three years. This poverty map has become the operational basis for targeting a major poverty alleviation program, comprising decentralized grants to poor villages. In addition, the poverty map has focused geographic targeting of many other government programs in different sectors.

A second key element of the future agenda is to improve the **institutional linkages** between the National Institute of Statistics as the technical agency responsible for the quality of data production, and its client policymakers in the Ministry of Planning and the relevant line agencies. In order to make effective use of the household survey database, the clients need to perceive it to be useful by contributing to design of the content of the surveys so that they are responsive to key policy questions.

A third factor which conditions the strength of institutional linkages is **timeliness** of turnaround from the surveys. Improving the speed of data processing, availability and dissemination to users in the government would probably require significant enhancement in PC-based computing capacity at the National Institute of Statistics.

Finally, for Cambodia to benefit fully from these improvements in the design, regularity and turnaround in the information base on living standards will require continuing improvements in the analytical skills of policymakers and researchers in Cambodia through a combination of training and hands-on experience. Meeting this objective demands a new effort to train staff in methods of **applied policy analysis** in government agencies.

Proposed Work Program. Development of an integrated household survey system using a core/module design would need to be sustained over a multiyear period. The full cycle should last three years to allow for the necessary expansion in sample size, refinements of survey design, and capacity building in operational procedures. At the end of this period the National Institute of Statistics would have implemented all the components of a fully integrated multipurpose household survey system, and should be prepared to maintain it on a routine basis.

Ultimately the operational value of improving the poverty related information base provided by the integrated household survey system will depend on the capacity to analyse the data and interpret its practical implications for policymakers. This capacity needs to be located within the Ministry of Planning because of the complex cross-sectoral agenda involved in formulation of antipoverty policies, and the need to interact with policymakers involved in setting strategic priorities between and within different sectors. Several other countries have adopted this approach. For example, in Indonesia the World Bank is currently financing a Social Sector Capacity Building Project implemented by the planning ministry (BAPPENAS). The project establishes a technical advisory capacity managed by BAPPENAS and linked to the line ministries.

International donors are committed to supporting the poverty reduction goal set forth in the First Socioeconomic Development Plan, and share a common interest with the government in strengthening the information base on living standards in Cambodia so as to improve the policy dialogue on sectoral priorities and project design. Accordingly, the donors need to work together in mobilising the external financing required to implement the joint work program on data collection and policy analysis which will be necessary to underpin the government's policy commitment to fight poverty. UNDP has taken the lead

in coordinating this effort in the framework of a new project on Capacity Development for Socio-Economic Surveys and Planning.(CMB/96/019/A/01/42).

1. INTRODUCTION

Poverty reduction is a central goal of Cambodia's First Socioeconomic Development Plan, 1996-2000. Better and up-to-date information about the poor is essential to assist the Government in designing effective policies for attacking poverty. Who are the poor? How many poor are there? Where do they live? What are their sources of income? Policies intended to help the poor are unlikely to succeed unless the Government knows who the poor are and how they are likely to respond to public interventions. This report develops a consistent nationwide profile of poverty to support the Government's effort to strengthen the design and targeting of poverty reduction policies. The poverty profile is based on the first Socio-Economic Survey of Cambodia (SESC) carried out by the National Institute of Statistics in 1993/94 and cosponsored by the Asian Development Bank and the United Nations Development Programme. The SESC collected data from about 5,600 households representing Phnom Penh, other urban, and rural areas in Cambodia.

For policy purposes the most important reason for measuring poverty is not the need for a descriptive number, but to make poverty comparisons in order to target antipoverty programs and monitor development progress. Is poverty higher among certain population groups--rural areas, regions, ethnic minorities--than others? Has poverty decreased over time? Setting a poverty line is a prerequisite for measuring poverty in order to make these poverty comparisons. Unlike most of its neighboring countries, the Royal Government of Cambodia has not yet established a firm basis for setting an official poverty line. This report sets new poverty lines for Cambodia based on standard methods used by the World Bank in poverty estimates for neighboring countries. These poverty lines are based on a benchmark per capita calorie requirement of 2,100 calories per day -- with the composition of the underlying food bundle chosen to be representative of typical consumption patterns in Cambodia -- and they take into account geographic price variations in the cost of the same food basket. Comparing these poverty lines with the distribution of per capita consumption expenditure from the SESC yields poverty estimates for 1993/94.

Section B begins by describing the SESC questionnaire and sampling frame. This is important in interpreting the representativeness of the empirical results because not all areas of Cambodia were included in the sampling frame for the 1993/94 survey. Section C presents basic data on the level and distribution of living standards as measured by per capita household consumption expenditures. Section D then sets new poverty lines for Cambodia using standard World Bank methods. Section E uses these poverty lines to make poverty comparisons for targeting purposes -- assessing differences among regions,

sectors of employment, levels of education, gender and household size. Section F switches to international poverty comparisons, comparing the poverty estimates for Cambodia with recent World Bank estimates for Laos, Vietnam and Indonesia. Section G concludes the assessment of consumption-based measures of poverty by evaluating the difference between the official poverty estimates presented in the First Socioeconomic Development Plan and the revised estimates presented in this report. Finally, Section H gives an overview of the distribution of selected non-monetary welfare indicators between the poor and the better off in Cambodia.

2. SOCIO-ECONOMIC SURVEY OF CAMBODIA, 1993-1994

The data analysis is based on the Socio-Economic Survey of Cambodia held in 1993-1994 (SESC 1993/94). The survey was carried out by the National Institute of Statistics with technical assistance provided by the Asian Development Bank and UNDP. The SESC included 3,2079 people in 5,578 households. The survey was administered over four rounds to capture seasonal patterns in consumption. All sampling units were sampled in every round. The first round of the survey was conducted in the fall of 1993, the remaining three rounds in the succeeding three quarters of 1994. The survey distinguishes three main strata: Phnom Penh, Other Urban centers and the Rural areas.

Sample Design

Sample selection was based on a stratified two-stage random sample design. Stratification took place at the level of three main geographic domains: Phnom Penh, Other Urban and Rural. Within each domain, villages were selected at random in the first stage. Households were sampled in the second stage. Villages with more inhabitants had more households sampled. Villages were sampled on the basis of the UNTAC frame. Households were sampled on the basis of a listing of all households in the selected villages. The design was self-weighting in the sense that within each of the geographical strata, each household had an equal probability of being selected into the survey. The survey data files include an expansion factor¹ which can be used to obtain estimates for the surveyed areas. The sampling frame was derived from the nationwide village population data file prepared by the United Nations Transitional Authority (UNTAC) in Cambodia.

Sample Coverage

It is important to note that the survey used a **truncated sampling frame** which did not cover all of Cambodia. The truncated frame excluded those areas which were unsafe at the time of the survey or which were sparsely populated and expensive to reach. For example, some of the northern provinces could only have been reached through Vietnam. Thus the geographic coverage of the survey was limited to only 15 out of Cambodia's 21 provinces. Within those provinces which were covered by the SESC, selected villages were also excluded for security reasons. Altogether, 90 urban villages and 5,093 rural villages were excluded from the list of primary sampling units covered by the truncated sampling frame. Table 1 summarizes the resulting coverage of the

¹ The expansion factor is defined as one over the sampling probability for households.

truncated frame relative to the original UNTAC frame, together with the actual sample size selected within each stratum.

Table 1: Coverage and Sample Size of SESC 1993/94

		Sample size	Expansion factor	Truncated frame /a	UNTAC frame	Percent coverage
Phnom Penh	Village	160	3	496	496	100
	Household	1,708	71	121,134	121,134	100
	Individuals	10,254	65	667,814	667,814	100
Other Urban	Village	99	6	566	673	84
	Household	1,151	108	124,012	136,277	91
	Individuals	6,835	87	595,993	661,872	90
Rural	Village	239	27	6,489	11,588	56
	Household	2,719	348	947,147	1,457,149	65
	Individuals	14,990	299	4,488,565	7,493,809	60
Cambodia	Village	498	15	7551	12,798	59
	Household	5,578	214	1,192,897	1,754,260	68
	Individuals	32,079	179	5,752,372	8,823,495	65

/a Count based on UNTAC listings

Source: National Institute of Statistics, Ministry of Planning

Looking first at coverage in terms of villages, all of the 496 villages in Phnom Penh were covered. In Other Urban areas, the truncated frame covered 566 or 84% of the villages. By contrast, coverage of Rural areas was significantly incomplete, including only 6,489 or 56 percent of the villages.

Expressed in terms of coverage of **households** – taking into account variations in household density per village -- the SESC sample covered 68 percent of all households in Cambodia, ranging from 100% in Phnom Penh to 65% in Rural areas. Apparently the less populated villages have been excluded from the survey. Sampling was more dense in the urban areas. The average expansion factor for households is 71 in Phnom Penh and 107 in Other Urban areas. In contrast, for the rural domain the average expansion factor amounts to 348.

Overall, the survey covered 65% of the **individuals** of Cambodia – slightly lower than the percentage of households (68%). Coverage ranged from 100% of the population living in Phnom Penh, to 90% of the population in Other Urban areas and only 60% of the Rural population. All the empirical results presented in this report are valid only for those areas which were included in the survey.

SESC Questionnaire

Since the main objective of the SESC was to generate expenditure weights for a new consumer price index, the survey questionnaire collected very detailed information on consumption patterns. The survey distinguishes 177 food items of food **expenditure**. For each item the respondent was asked to provide the quantity consumed in the past week and the value of this consumption. Next, the respondent was asked to separate this amount between cash expenditures and in kind consumption. Cash expenditures include all goods purchased at the market, in cash or on credit. In kind consumption includes gifts and consumption of home produced goods. Both for in cash and in kind consumption the survey collects both quantities and values. In case the respondent indicates that his consumption on a particular item includes both cash as well as in kind expenditures, the interviewer is instructed to use the market price to value the in kind consumption. The survey distinguishes 266 different categories of **nonfood consumption**. The reference periods for nonfood consumption differ depending on the item. For nonfood consumption only expenditure values were collected. Again, the survey distinguishes between in kind and in cash consumption.

The information gathered in the survey is sufficient to construct a descriptive poverty profile using consumption-based measures of poverty. The distribution of per capita consumption expenditure is available, together with the detailed data on quantities of food consumption which are needed to construct a calorie-based poverty line. Prices for food items can be derived in the form of unit values from the survey data, since both quantity and expenditure data were collected. However, the SESC 1993/94 is not sufficiently detailed to undertake a thorough analysis of the causes and consequences of poverty. This would require a comprehensive multipurpose survey linking detailed information on household consumption behavior, incomes and employment, and social services at both the household and community levels.

Data Cleaning

The results presented in this report were obtained after two minor data cleaning operations. In the first place, where quantities were missing for food consumption but a nonzero consumption value had been recorded, quantities were imputed using the estimated price for that particular food item. Second, if a quantity (value) was outside the 95 percent confidence interval, and the unit value for that observation differed by factor of more than five from the estimated price for that region, the quantity (value) was imputed on the basis of the value (quantity) and the estimated price for that food item. Note that the second data cleaning method does not automatically erase extreme values. If the value and quantity observation both indicate an extremely high consumption, and hence the unit value is close to the estimated price, the observation is retained.

3. PER CAPITA CONSUMPTION, DISTRIBUTION AND INEQUALITY

Per Capita Consumption

Per capita consumption is widely used as a basic indicator of welfare standards. Per capita consumption in the survey areas averaged about 1,314 Riels per day in 1993/94, which is roughly equal to about USD218 per year (see Table 2). The high share of food in total household consumption expenditures is another indicator of Cambodia's low standard of living: on average 67% of all consumption expenditures are devoted to food consumption. A further indicator is the low level of calorie consumption, averaging 2,261 calories per capita per day. These indicators of low average consumption mask wide differences in consumption standards between different population groups. Looking at differences in real consumption -- nominal consumption expenditure deflated to take into account spatial cost of living differences -- shows a fairly large disparity between the vast majority of the population that live in rural areas and those who live in urban areas. Real per capita consumption expenditure is more than twice as high in Phnom Penh, and 50% higher in Other Urban areas.

Table 2: Summary Indicators of Per Capita Consumption 1993-94

	Per capita consumption per day			
	Nominal	Real /b	Calories	Food share
Quintile/a				
1-poor	734	963	1,676	0.75
2	1,029	1,356	1,997	0.71
3	1,314	1,721	2,200	0.69
4	1,803	2,307	2,405	0.66
5-rich	4,281	4,962	2,846	0.57
Region				
Phnom Penh	4,367	4,367	2,156	0.56
Other Urban	2,412	2,873	2,132	0.67
Rural	1,403	1,887	2,247	0.69
Total /c	1,832	2,262	2,225	0.68

/a Quintiles are constructed on the basis of real per capita consumption per day; aggregation of the quintile distribution is based on sample weights

/b Real consumption data are expressed in Phnom Penh prices using the Laspeyres price deflator reflected in the food poverty lines for each region.

/c Total refers only to mean values for the truncated areas covered by SESC.

Distribution of Per Capita Consumption by Province

A true nationwide breakdown of the geographic distribution of per capita consumption between provinces is not available because 6 out of Cambodia's 21 provinces were excluded from coverage by the SESC (Preah Vihear, Koh Kong, Mondol Kiri, Ratanak Kiri, Stung Treng and Kratie). The estimated mean values of per capita consumption expenditure in the 15 provinces which were covered are shown in Table 3. Because of village exclusions within the covered provinces, the sample size on some of these provinces was small. Accordingly, the provincial means are shown together with the 95 percent confidence intervals. The main urban centers -- Phnom Penh and Sihanouk Ville -- are clearly the best off. The two provinces surveyed in the coastal region -- Kompong Som and Kom Pot -- have significantly higher per capita consumption levels than the other regions. Border provinces in the far West near Thailand, and in the East near Vietnam, have the lowest average consumption levels. Most of the Northern provinces along the border with Vietnam, Laos and Thailand were excluded from the survey.

Table 3: Distribution of Per Capita Consumption by Province
(in Riels per day)

	Number of households in sample	Daily per capita consumption			95% confidence interval of mean		
		median	mean	Standard error of mean	lower band	upper band	
Phnom Penh	1708	1219	4367	116	4140	4594	
Kandal	510	1381	1642	45	1553	1730	
Kompong Cham	664	1195	1426	36	1356	1496	
Svay Rieng	270	1092	1194	35	1125	1262	
Prey Veng	594	1225	1465	32	1403	1527	
Takeo	413	1226	1521	100	1325	1718	
Plain regions	4159	1323	1878	36	1808	1949	
Kompong Thom	97	1269	1779	143	1495	2064	
Siem Reap	175	1219	1549	114	1323	1775	
Banteay Meanchey	206	1137	1412	111	1194	1631	
Battambang	293	1125	1392	54	1286	1497	
Pursat	207	1333	1697	89	1522	1872	
Kompong Chhnang	136	1271	1585	90	1408	1762	
Tonle Sap Lake region	1114	1219	1529	39	1453	1605	
Sihanouk Ville /a	70	4395	5162	378	4407	5917	
Kom Pot	130	1147	2159	573	1025	3294	
Coastal Region	200	1397	2803	431	1953	3652	
Kompong Speu	105	1214	1296	54	1189	1403	
Plateau and Mountain Region	105	1214	1296	54	1186	1403	
Cambodia	5578	1300	1833	32	1770	1895	

/a Kompong Som province

Individual Distribution of Per Capita Consumption

The disparities in individual per capita consumption standards attained by the Cambodian population are illustrated by the cumulative distribution function showing the proportion of the population which is at or below a given consumption standard. The cumulative distributions of **per capita expenditure** on food, non-food and total items are shown separately for each of the survey regions in Figures 1, 2 and 3. The lines show the fraction of the population on the vertical axis whose consumption is less or equal to the amount indicated on the horizontal axis. Note that the consumption values on the horizontal axis are expressed in logarithms. In Phnom Penh, the upper tail of the individual consumption distribution is sufficiently well off that the food and non-food expenditure distributions cross over before reaching a cumulative 80% share of the population. In other words, for at least the richest 20 percent of the population per capita expenditures are high enough to allow nonfood spending to exceed food expenditures. By contrast the distribution of individual consumption levels in the Rural sample is sufficiently low that food consumption exceeds nonfood spending for everybody.

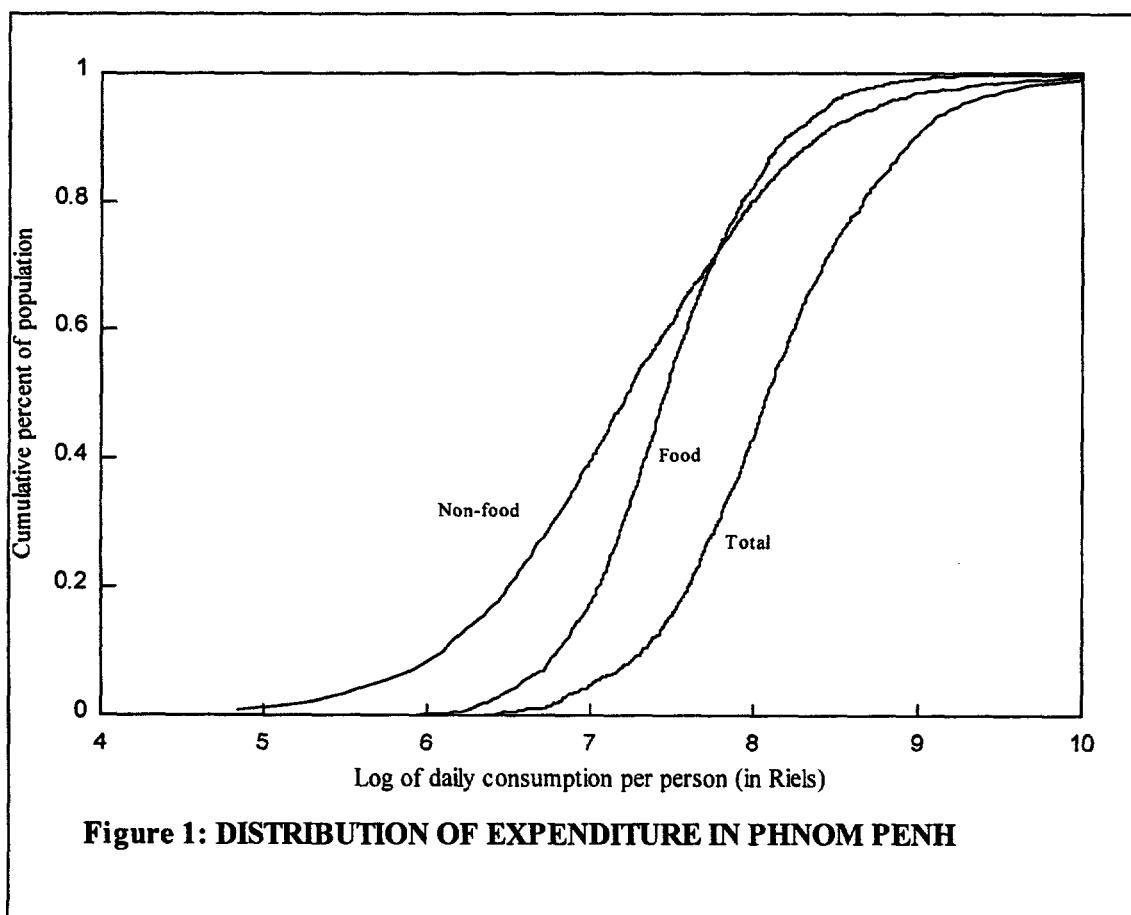


Figure 1: DISTRIBUTION OF EXPENDITURE IN PHNOM PENH

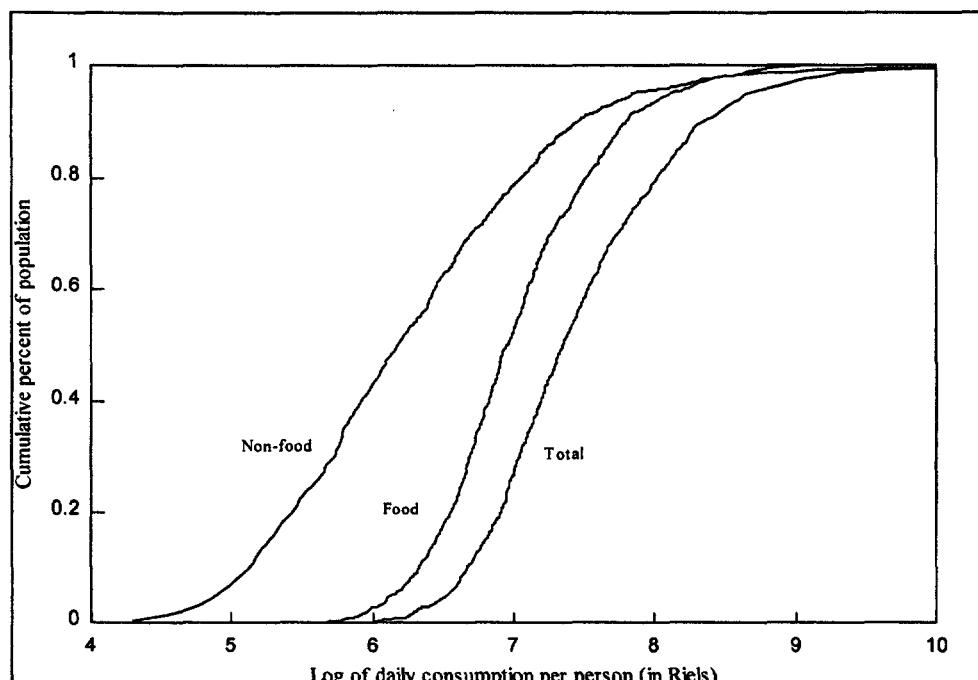


Figure 2: DISTRIBUTION OF EXPENDITURE IN OTHER URBAN AREAS

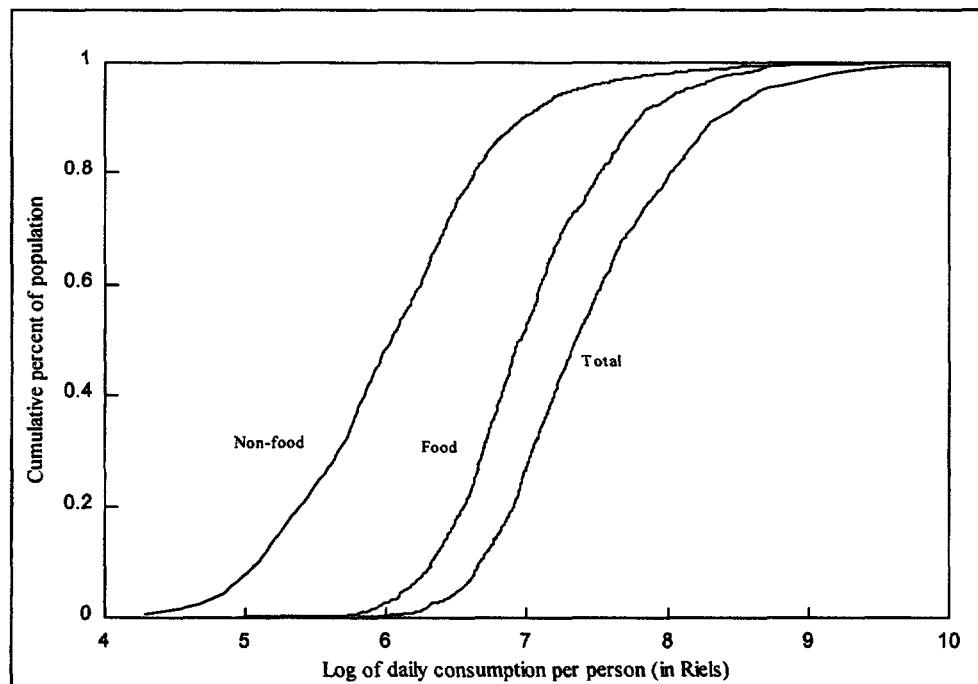


Figure 3: DISTRIBUTION OF EXPENDITURE IN RURAL AREAS

The cumulative distributions of **per capita calorie consumption** by region are compared in Figure 4. The disparities in individual calorie consumption are very wide, with around one-half of the population purchasing the equivalent of fewer than 2,100 calories per day. Note that daily calorie consumption in rural areas exceeds the level attained in urban areas, while the calorie distribution patterns within urban areas are very similar. This reflects the higher energy requirements of daily activities in rural areas.

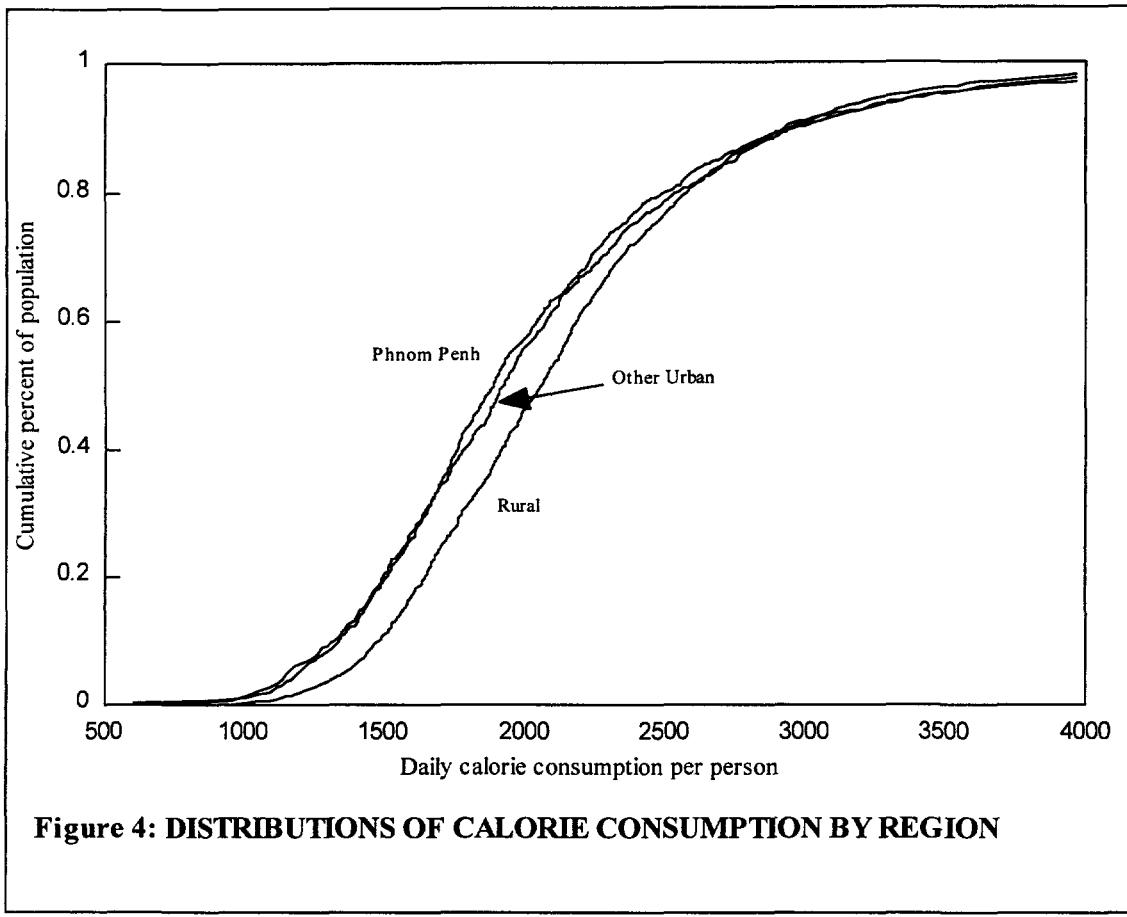


Figure 4: DISTRIBUTIONS OF CALORIE CONSUMPTION BY REGION

Inequality

How does inequality in Cambodia compare with other countries? Lorenz curves of the cumulative share of consumption as a function of cumulative population shares show that inequality in consumption expenditure is higher in urban than rural areas, with the greatest disparity evident within Other Urban areas (see Figure 5). The richest 10 percent of the population accounts for more than 30 percent of total consumption expenditure in the urban areas, while the poorest 10 percent consume less than 3 percent.

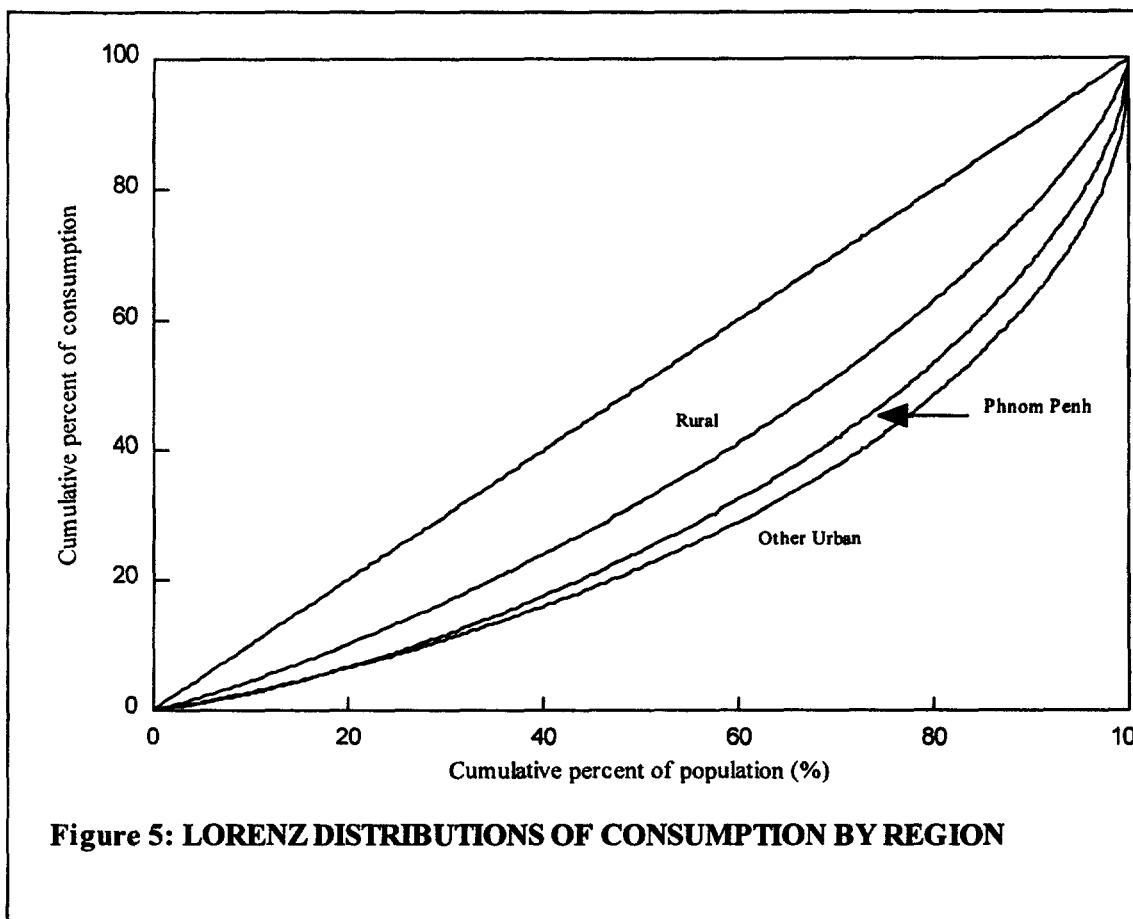


Figure 5: LORENZ DISTRIBUTIONS OF CONSUMPTION BY REGION

Table 4: Inequality Measures by Region

	Gini	T1/b	T2/c	LV/d	Consumption share (%) of poorest 10%	Consumption share (%) of richest 10%
Phnom Penh	0.39	0.31	0.26	0.46	2.5	31.2
Other Urban	0.44	0.46	0.33	0.49	2.7	36.7
Rural	0.27	0.13	0.12	0.21	4.4	22.9
Total/a	0.38	0.33	0.25	0.37	3.4	32.8

/a Total refers to sampled areas only

/b T1 is the population weighted Theil measure of inequality

/c T2 is the per capita consumption weighted Theil measure

/d LV is the variance of the logarithm of per capita consumption

The Gini coefficient -- defined as the ratio of the area between the Lorenz curve and the 45 degree line of complete equality -- ranges from a maximum value of 0.44 in Other Urban areas to a minimum value of 0.27 in Rural areas (see Table 4). Gini coefficients for neighboring countries are 0.32 in Laos, 0.34 in Vietnam and 0.32 in Indonesia. Given the heavy weight of rural areas in the population, Cambodia appears to exhibit a similarly low degree of overall inequality as some of its neighboring countries.

4. SETTING A POVERTY LINE FOR CAMBODIA

The starting point for developing an appropriate poverty line is the basic notion that food is the most fundamental need of human beings. Extreme lack of food leads to death, while chronic insufficiency of food leads to physical weakness, greater susceptibility to disease and, among children, impaired cognitive development. This suggests that any method for calculating a poverty line should be closely tied to sufficient food intake. A large biomedical literature exists which attempts to calculate the amounts of food needed for normal daily activities and long-term health. While nutritional needs encompass a large range of requirements (protein, energy, and many micronutrients), for purposes of assessing the extent of poverty it is best to focus on energy intake, which is probably the single most important indicator of adequate food consumption. Measuring energy intake in terms of calories, it is possible to estimate a poverty line by calculating how much money is just enough to allow a household to meet its daily calorie needs as estimated by biomedical studies. Following recent common practice in other East Asian countries, this report adopts the benchmark per capita calorie requirement of 2,100 goto

For the poverty line to be realistic, it needs to allow households to consume a "typical" basket of foods reflecting local tastes, rather than requiring a household to spend all its money on the single food item which has the lowest "price per calorie." This report takes the composition of food consumption in the third quintile--which on average consumes nearly 2,100 calories--as the reference composition of an appropriate food bundle. The cost of this reference food bundle is then determined in different regions taking into account local variations in the cost of the same food basket. This yields the food component of the poverty line. An additional allowance needs to be made for consumption of non-food goods. Even households that are poor in the sense that they are consuming less than their recommended daily calorie requirement still spend some of their money on non-food items. This report incorporates a minimal allowance for non-food goods based on the typical non-food spending of those who can just afford the reference food requirement but actually displace some amount of food expenditures

Food poverty line

As noted above, the benchmark adopted for setting the food poverty line is a 2,100 calorie minimum energy requirement per person per day. In principle, one could allow the calorie requirement to vary by age, weight and the activity of the individual. Table 5 illustrates the calorie requirements for different types of individuals. The heavier the daily activity, the more calories are needed. Children generally need less calories

than adults. These examples suggest that the 2,100 calorie requirement used in this report is conservative and may be considered a minimum daily energy requirement.

Table 5: Differential Energy Requirements

	Calorie requirement
Subsistence farmer	2780
Male engaged in heavy work	3490
Rural woman in developing country	2235
10 year old boy in developing country	2080
10 year old girl in developing country	1915

Source: WHO (1985)

Setting the poverty line requires specification of a basket of food items yielding exactly 2,100 calories. The relative composition of the basket is obtained from observed dietary patterns. To determine a typical consumption pattern, a reference household has been constructed. The reference household is derived from observations in the middle (third) quintile in the per capita consumption distribution (appropriately weighted). The reference food bundle is constructed by taking average values of the reported quantities for every food item. Next, the calorie content of this basket is determined. The food basket for the poverty line is obtained by scaling all quantities by the same factors such that the basket has a calorie content of 2100. In the Cambodian case, the reference food bundle has a calorie content of 2298 calories. As a result all quantities were scaled down by a factor $(2100/2298) = 0.9138$.

The quantities of food in the reference food consumption bundle are listed in Annex 2 together with the calorie values which were used to derive its contents. For some categories, such as meals eaten outside of home, no predetermined calorie values exist. The assumption underlying the calorie computations is that food eaten outside of home is typically twice as expensive in terms of Riels per calorie as food prepared at home. This assumption is implemented as follows: For all households the Riels per calorie value of food prepared at home is determined. Next, the median value is taken for each region. These, multiplied by two, are then used as the prices per calorie for food eaten outside of home. The results are shown under the price listings for each region.

The choice of the third quintile as the reference household deserves further comment. The third quintile was used for two reasons. First, because the third quintile

was also used in constructing the poverty estimates which are reported in the First Five-year Socioeconomic Development Plan. And second, because the benchmark of 2,100 calories per day is attained among this group of the population. In general, one observes that the poorer the reference group, the more rice (and less meat) oriented the consumption basket. Since rice has a high calorie content per Riel, poverty lines based on the consumption pattern of poorer reference households will tend to be lower.

Having constructed the reference food bundle, it was priced against local market prices in each region. Separate price estimates were obtained for the three geographical regions distinguished in the SESC. Prices are estimated by taking median unit values of cash purchases for each product. Medians were used in order to make the estimate less sensitive to measurement error. In case less than 10 purchases were observed in a region, the price estimate is based on the median unit value in the whole sample. Using data on cash purchases only ensures that the price estimates represent market prices. In general, the analysis shows that the self-assessed value of in kind consumption has a lower unit value. One possible explanation for this could be that farmers retain their bad quality products for own consumption and sell the good quality on the market. Since the food poverty basket should reflect similar qualities in urban and rural areas, it was decided to use market prices to value the food basket.

This method yields a food poverty line of 1,185 Riel per day for Phnom Penh, 995 Riel per day for Other Urban areas and 881 Riel per day for Rural areas. These lines represent the minimum expenditure required per person to reach a daily calorie consumption of 2,100. The food poverty lines and the underlying breakdown by broad food categories are shown in Table 6. More than two-thirds (69%) of the calories are obtained from cereals, especially rice. Cereals are a cheap way of obtaining calories - at most 28 percent of the total food poverty line is allocated for purchasing cereals. Meat consumption is the largest expenditure category in all regions. The high calorie values for beverages mostly stem from the consumption of local wines. The calories in "sugar, salt and seasoning" are driven by the use of sugar and fish sauce. The resulting food poverty line is thus a Laspeyres price index for food, where the consumption bundle of the reference household provides the weights for each of the food items.

Table 6. Composition of Food Poverty Line by Food Group
 (in Riels per person per day)

	Phnom Penh	Other Urban	Rural	Calories
	1184.9	995.3	881.4	2100
Beverages	51.3	37.1	31.2	122.3
Cereal	289.0	247.3	246.8	1440.2
Dairy products	7.6	2.7	5.7	1.5
Eggs	20.6	20.8	20.7	7.8
Fruit	104.5	78.2	62.5	55.6
Meat	433.7	368.3	311.7	202.8
Oils and fat	13.1	12.8	12.5	50.3
Other food products	54.4	35.4	26.2	55.7
Sugar, salt, spices and seasoning	92.3	84.2	81.0	121.5
Vegetables	118.3	108.5	83.1	42.2

Non-food allowance

The method used to construct the non-food allowance in the poverty line was originally developed by Ravallion & Bidani in poverty estimates for Indonesia. They defined basic non-food spending requirements in terms of how much is spent on non-food goods by households who are just capable of reaching their nutritional requirements. In other words it is the amount of non-food spending which people who are at the food poverty line will allow to displace basic food expenditure as reflected in the food poverty line. This amount is determined on the basis of observed non-food consumption of households whose total expenditures equal the food poverty line. Apparently these households consider spending part of their expenditure on non-food items welfare improving. The welfare derived from this amount of non-food expenditure is apparently higher than welfare derived from the foregone food expenditures. It can thus be considered a minimal allowance for non-food spending.

Regression analysis is used to identify the typical value of non-food expenditures of households capable of reaching the food poverty line. The following food demand function, representing the food share as a linear function of the value of total spending relative to the food poverty line, has been estimated:

$$s_i = \alpha_j + \beta \log(x_i / z_j^f) + \varepsilon_i \quad i = 1, \dots, N$$

j = 1(Phnom Penh), 2(Other Urban), 3(rural)

where

s_i = share of total expenditure of household i devoted to food

x_i = total expenditure of household i

z_j^f = food poverty line in region j

The log in the regression ensures that the equation will fit a pattern of a diminishing food share as total expenditures increase. By allowing the constant term to differ by region, this method yields different shares of the non-food allowances in the poverty line for each region. This is necessary because price differences between regions of non-food items may be different from price differences of food items. The regression results are given in Table 7.

Table 7: Estimated Food Demand Equation
 (dependent variable: food share in total consumption)

	Estimated coefficient	Standard error
constant	0.729846	0.00196
dummy Phnom Penh	-.0628002	0.0053
dummy Other Urban	-.0019263	0.0049
beta	-.1076779	0.0029

R squared 0.28

Using this approach, the estimated non-food allowance is 393 Riels per day in Phnom Penh, 269 in Other Urban areas and 236 in Rural areas.

Poverty Lines

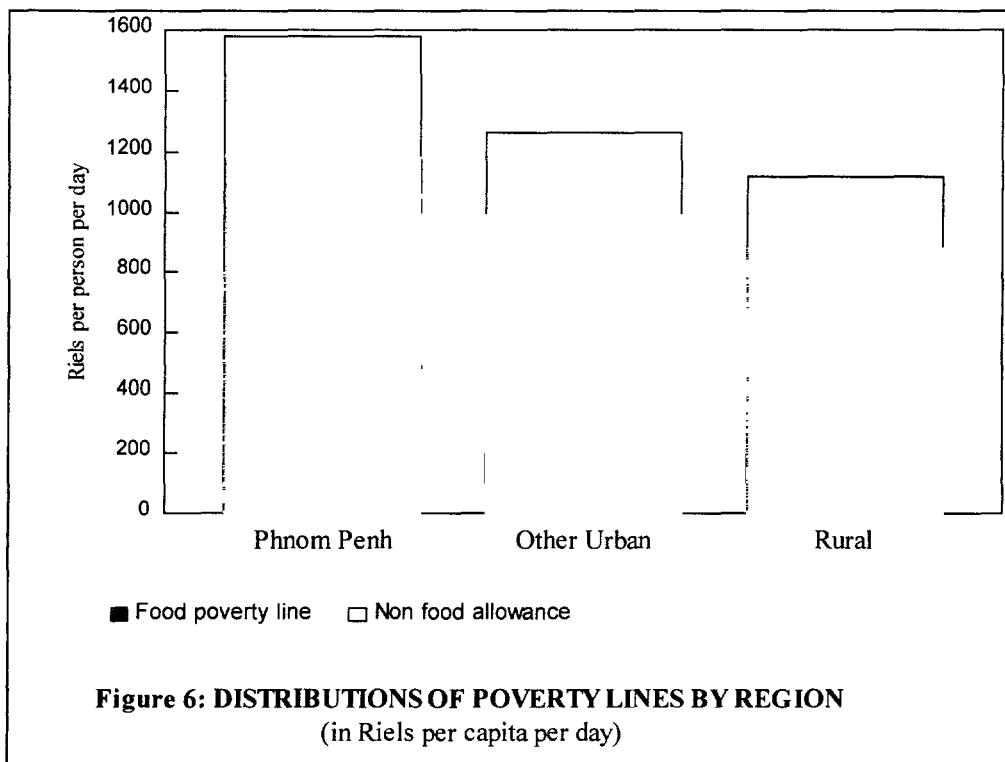
The poverty lines are obtained by adding the non-food allowance to the food poverty line for each region. After some calculus, it can be shown that the poverty line equals

$$z_j = z_j^f (2 - \alpha_j)$$

where

z_j = The poverty line for region j .

The resulting overall poverty lines for Cambodia in 1993/94 are 1,578 Riels per person per day in Phnom Penh, 1,264 Riels for Other Urban and 1,117 Riels for the rural areas. These poverty lines, and their underlying food and non-food allowances are summarized in Figure 6.



5. POVERTY COMPARISONS FOR TARGETING

Choosing a Poverty Index

Having set the real poverty line for Cambodia, an index of poverty needs to be chosen which calculates the extent of poverty based on the distribution of household expenditure. The most commonly used index of poverty is simply the proportion of the population whose expenditure levels fall below the poverty line, often called the **head-count index**. One limitation of the head-count index is that it does not measure how far poor households' expenditure levels do fall below the poverty line. A second index of poverty which does take into account variations in how far poor households' expenditure levels fall below the poverty line is known as the **poverty gap index**. The poverty gap measures the average shortfall (gap) between the poor households' expenditure levels and the poverty line. A third measure, the poverty severity index, goes further and takes into account the distribution of living standards among the poor. This measure is sensitive to such inequality, indicating more poverty when the average poverty gap is more unequally distributed among the poor. All of these belong to the general class of Foster- Greer- Thorbecke poverty measures (see Box 1.1).

In practice, comparisons of poverty across different groups, or over time, may not yield results that vary substantially over these different indices. However, just as it is important to use more than one poverty line to see whether important results are sensitive to the choice of the poverty line, it is also important to check the sensitivity of results to different poverty indices.

Regional Poverty Comparisons

Targeting the design and placement of antipoverty programs is essential to reach disadvantaged groups and backward areas effectively and efficiently. In practice, one of the most important uses of the poverty profile is to support efforts to target development resources towards poorer areas, aiming to reduce aggregate poverty. Is poverty higher or lower in certain geographic regions? This question can only be answered at a highly aggregated level by the SESC because of the limited number of geographic domains which were sampled. The survey only supports an urban/rural comparison between Phnom Penh, Other Urban and Rural areas. While this provides a broad sense of the appropriate policy orientation in regional targeting, it is obviously of limited practical value for choosing the geographic placement of project interventions.

Box 1. Three Different Poverty Measures

The Foster-Greer-Thorbecke (FGT) class of poverty measures is defined as follows:

$$P_\alpha = \frac{1}{N} \sum_{i=1}^N (1 - x_i^*/z)^\alpha \quad \text{where } x_i^* = x_i \text{ if } x_i \leq z \\ = 0 \text{ if } x_i > 0$$

where x_i is the expenditure level of the individual, z is the poverty line and N is the number of individuals in the population. In this general form the FGT poverty index appears rather abstract. The reason it is often used is that for particular values of α it gives the poverty indices discussed above. In particular, if α equals zero the FGT index becomes the headcount index, i.e. the fraction of the population whose expenditure levels fall below the poverty line.² If α equals one the FGT index becomes the poverty gap index, i.e. the average gap between individual's incomes and the poverty line (where non-poor persons are assigned a gap of zero), divided by the poverty line. Finally, if α is greater than one the FGT index becomes distributionally sensitive in that greater inequality in the gaps among the poor leads to higher estimates of poverty, other things being equal.

The regional poverty comparisons are presented in Table 8. Based on the overall poverty line, the incidence of poverty is found to be lowest by far in Phnom Penh, where only 11 percent of the individuals live below the poverty line. The second poorest group lives in Other Urban areas where the incidence of poverty rises steeply to 36%. The highest incidence of poverty is found in the rural areas where 43 percent are poor. Aggregating over the total SESC sample – which has a lower rural population weight of 78% than the true population distribution (85%) – gives a total poverty incidence of 39%.

How sensitive are these regional poverty comparisons to the choice of poverty line? Using the food poverty line yields considerably lower levels of poverty, but it does not alter the policy conclusion that poverty is highest in rural areas and lowest in Phnom Penh. The head count index falls to 22 percent in the rural areas, 20% in Other Urban areas and only 6% in Phnom Penh. The sample-weighted aggregate incidence of food poverty becomes 20%. This is still a high figure -- it suggests that around one-quarter of the population in Cambodia is food-poor in the sense that they cannot meet their daily basic calorie requirement even if they were to devote all of their consumption to the basic food basket.

²Note that $x^0 = 1$ for any number x not equal to zero. However, $x^0 = 0$ if x equals zero.

Table 8: Distribution of Poverty by Region

Food poverty line	N (%)	Head count index		Poverty gap		Severity Index	
		index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
Phnom Penh	10.7	6.2	3.3	1.3	3.7	0.4	4.0
Other Urban	11.0	19.6	10.8	4.4	13.1	1.4	14.8
Rural	78.2	21.9	85.9	4.0	83.2	1.1	81.2
Total /b	100.0	20.0	100.0	3.7	100.0	1.1	100.0
Poverty line							
Phnom Penh	10.7	11.4	3.1	3.1	3.6	1.2	4.1
Other Urban	11.0	36.6	10.4	9.6	11.6	3.6	12.6
Rural	78.2	43.1	86.5	10.0	84.9	3.3	83.3
Total /b	100.0	39.0	100.0	9.2	100.0	3.1	100.0

/a N denotes the number of observations in the sample expressed in percentage weights;

/b Note that the "Total" figure is representative for the sampled regions only and not for Cambodia as a whole.

The quantitative sensitivity of the poverty comparisons is illustrated in Figure 7. The graphs give an idea of how sensitive the poverty measures are to changes in the poverty line. The vertical lines in the graph denote the poverty lines for each region. For the rural areas, the intersection between the poverty line and the distribution graph is on a rather steep section of the distribution. This indicates that small changes in the poverty line will yield relatively large changes in the head count index - the number of individuals below the poverty line. By contrast, in Phnom Penh the intersection is on a rather flat part of the distribution which indicates that the results will be rather robust with respect to changes in the poverty line.

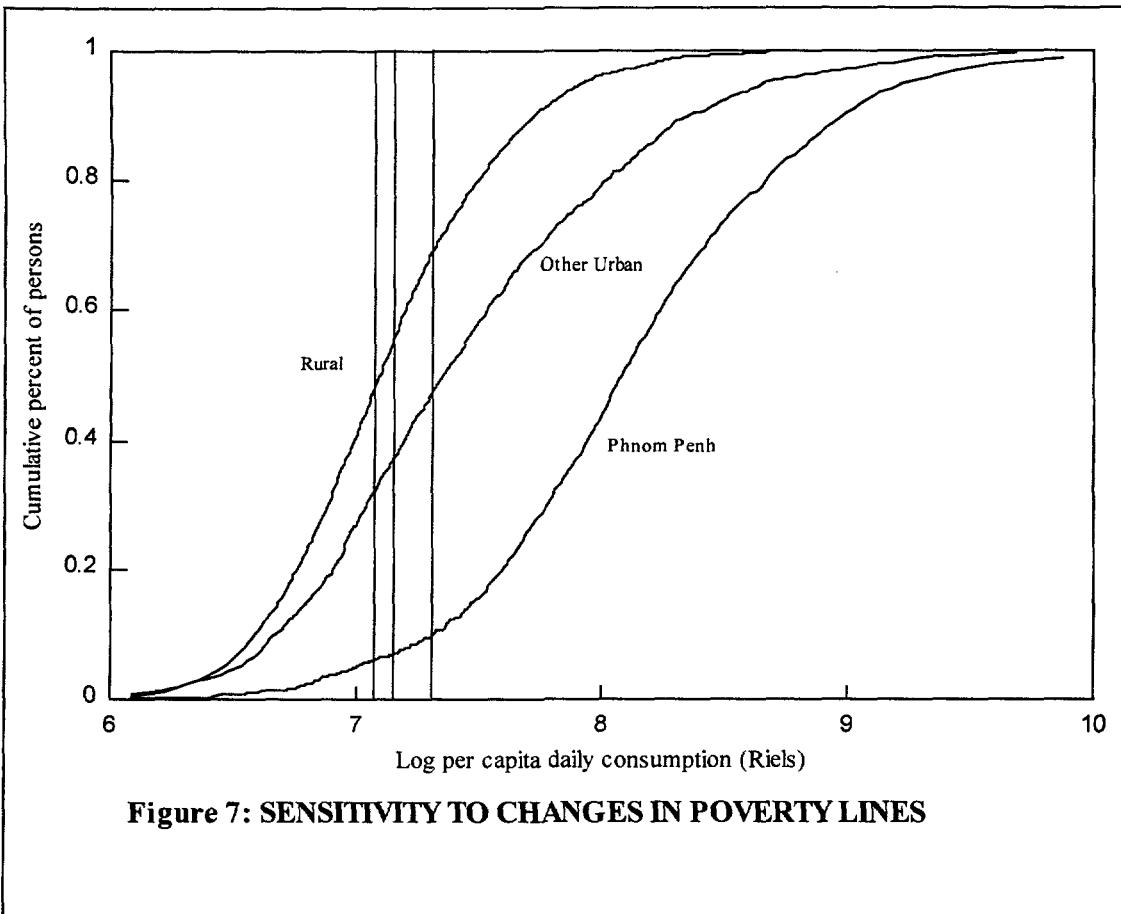
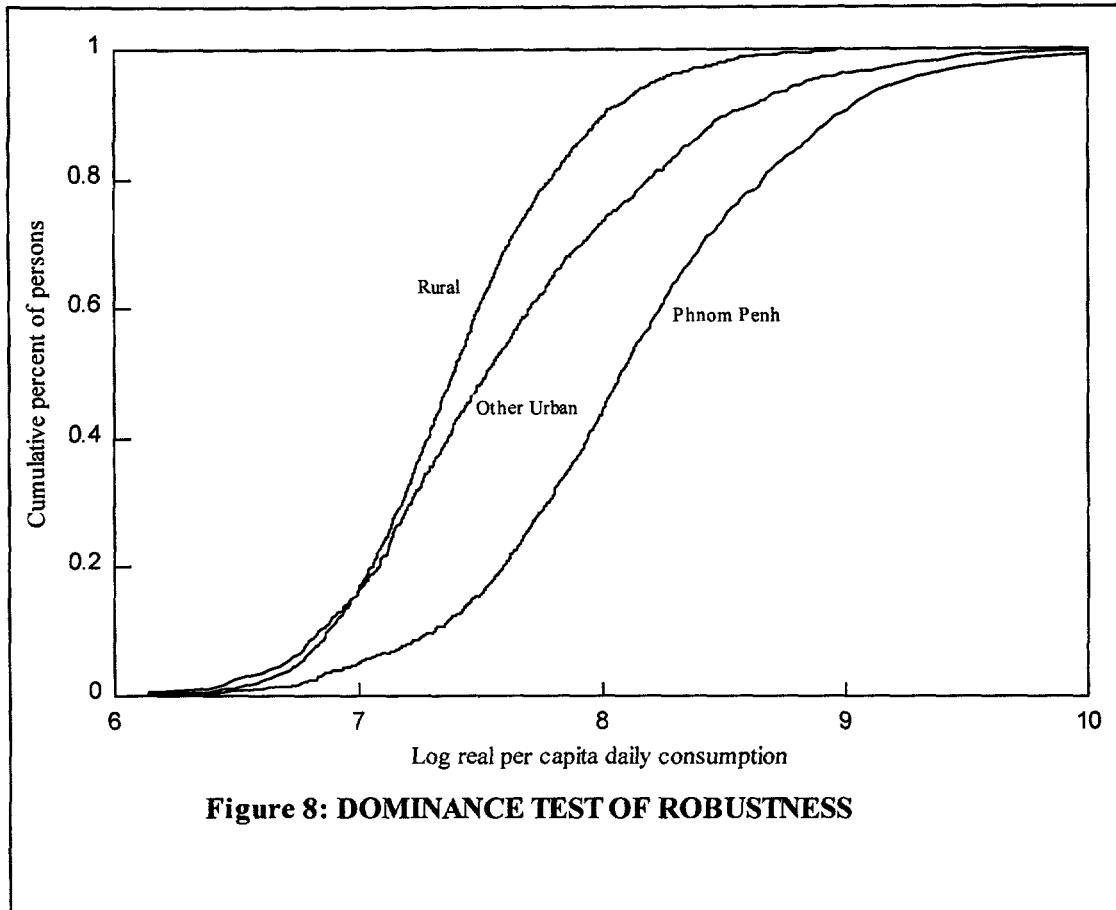


Figure 7: SENSITIVITY TO CHANGES IN POVERTY LINES

The qualitative robustness of the regional poverty comparisons can be assessed by the first-order dominance test of differences in the real per capita consumption distributions across regions. The real per capita consumption distributions expressed in Phnom Penh prices -- using the implicit spatial price deflators given by the relative food poverty lines -- are shown in Figure 8. The graph shows that the distribution of per capita consumption in Phnom Penh lies entirely below and to the right of the distributions for Other Urban and Rural areas. The Phnom Penh distribution curve does not intersect with the other curves so that first-order dominance of Phnom Penh holds unambiguously. In other words, Phnom Penh will emerge as the least-poor region wherever the real poverty line is set. However, the same is not true for poverty comparisons between Other Urban and Rural areas. In this comparison the consumption distribution lines do intersect in the poorest quintile so that first-order dominance does not hold over the entire distribution. Thus a very low poverty line would evaluate the incidence of poverty to be higher in Other Urban areas than Rural areas, while a higher poverty line would switch the results of the comparison.



Poverty Comparisons by Employment

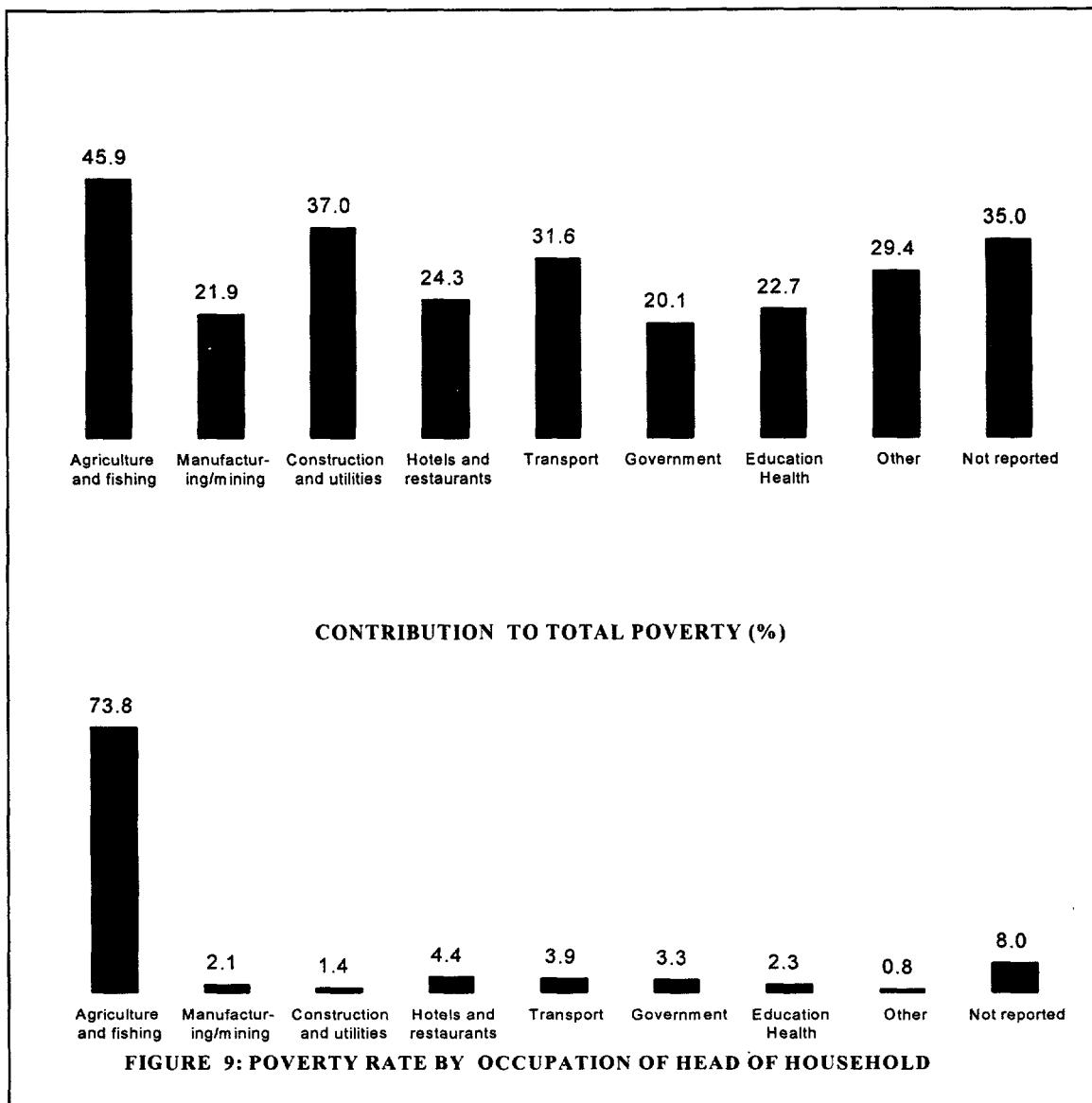
The vast majority of households in any country are able to escape poverty, or cannot do so, because of their earnings from employment. Thus it is important to examine the relationship between poverty and the types of employment of working-age household members. The most important income-earner is usually the head of household. Figures 9 and 10 examine the prevalence of poverty in two different ways: according to the occupation of the head of household and the type of employer of the head of household (detailed tabulations are given in Annex 1). Looking first at the distribution by **sector of employment**³, the highest poverty rate, 46 percent, is found among farmers. By

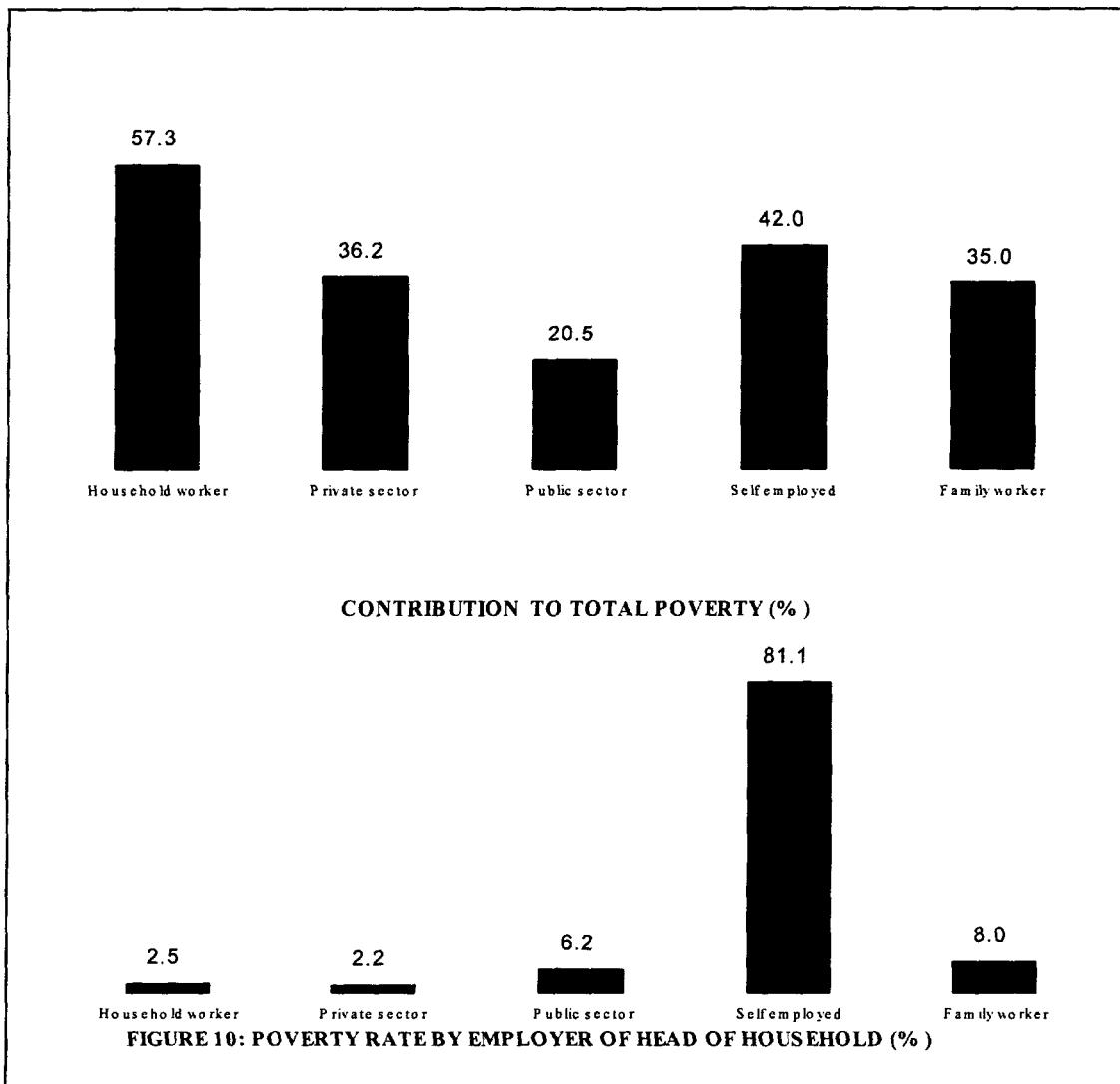
³ Sector of employment is grouped according to : “Manufacturing and mining” = Mining, quarrying, manufacturing; “Construction and utilities” = Electricity, gas, water supply, construction; “Hotels and restaurants” = Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods, hotels and restaurants; “Transport” = Transport, storage and communications; “Government” = Public administration, defense and compulsory social security; “Education Health” = Education, health and social work; “Other” = Financial intermediation, real estate, renting, business activities, private households with employed persons, extra territorial organizations and bodies.

contrast, households headed by someone working in public administration are least likely to be poor: in these occupations the poverty rate is only 20 percent. Clearly policies which aim at reducing poverty through enhancing income generating capabilities should be targeted towards the agricultural sector. Turning to the distribution of poverty according to **employer**⁴, those living in households where the head is self-employed is most likely to be poor (42 percent), followed closely by those working in the formal private sector (36 percent). The least likely to be poor are families where the household head works for the government. Only 21 percent of these households are poor --- far less than any other group in Cambodia. Thus policies directed at the formal labor market, such as an official minimum wage, will be highly ineffective in reducing poverty. Most people work outside of the regulated labor market. The only way to increase their incomes is by increasing their income generating capabilities.

Another way of looking at the distribution of poverty is in terms of the contribution of different employment groups to national poverty in Cambodia, taking into account both the prevalence of poverty and the group's share of the national population. Looking at the contribution of different **sectors of employment** to national poverty, the strongest policy message for targeting purposes is that more than three-quarters of the poor are found among households in which the head has an agricultural occupation. This reflects both the high proportion of people living in agricultural households and their above average poverty rate. This means that policies to reduce poverty in Cambodia must reach agricultural households if any major reduction in poverty is to be achieved -- any policy that misses the farmers will bypass more than 75% of the poor. The policy messages for targeting poor households based on their **employer** are very similar. Households in which the head works for the formal public or private sector account for less than 10% of overall poverty. In other words, policies that focus on employee conditions will miss nearly 90% of the poor in Cambodia.

⁴ "Family worker" includes the following categories: "Employer in own family operated farm or business", "Worked with pay in own family operated farm or business" and "Worked without pay in own family operated farm or business".



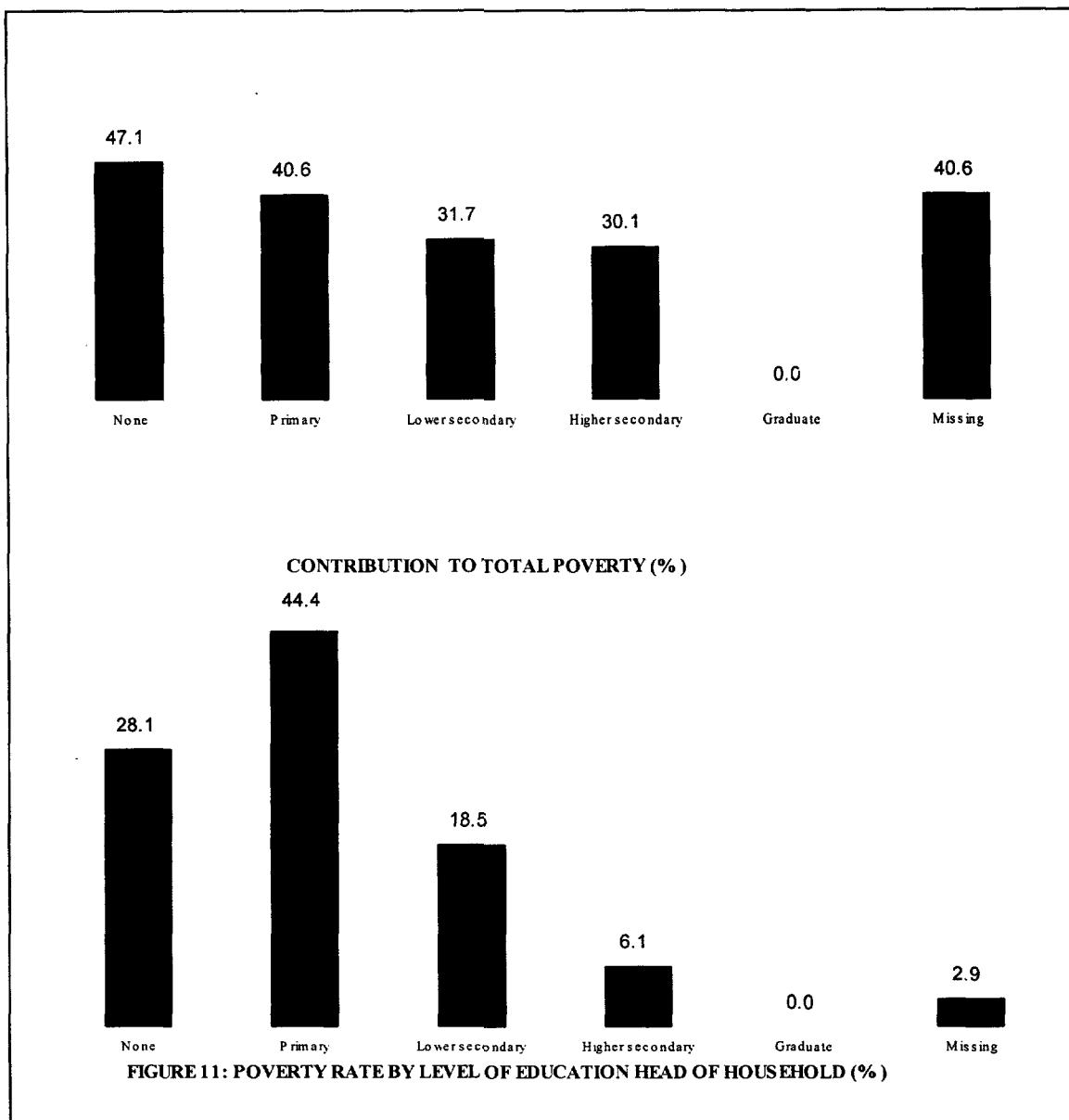


Poverty Comparisons by Level of Education

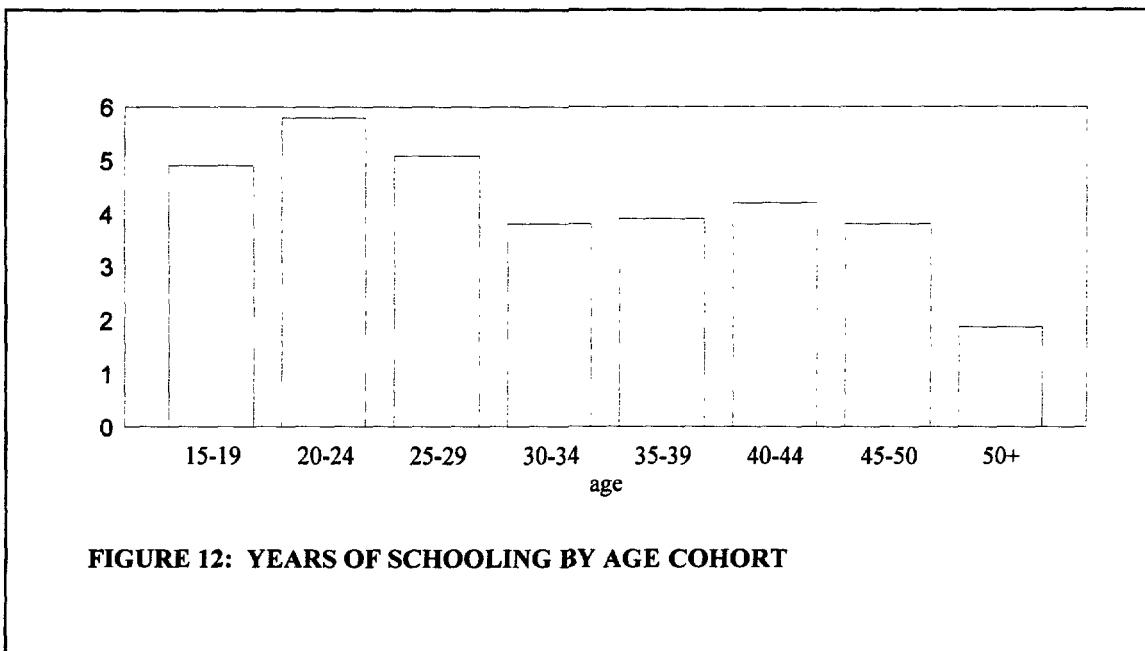
The relationship between poverty and education⁵ is particularly important because of the key role played by education in raising economic growth and reducing poverty. The better educated have higher incomes and thus are much less likely to be poor. As shown in Figure 11, Cambodians living in households with an uneducated head are more likely to be poor, with a poverty rate of 47 percent. But at higher levels of education, the likelihood of being poor becomes much lower. The prevalence of poverty among

ambodia, the education system offers primary, secondary and undergraduate training. Primary education provides 5 years of education, lower secondary 3 years and higher secondary 3 years.

households in which the head has completed secondary education falls to around 30 percent. Raising educational attainment is clearly a high priority in order to improve living standards.



Recent trends demonstrate progress towards this goal. As shown in Figure 12, the education levels of the younger generations are clearly improving: average years of education in the 20-24 years age group have risen to 5.8 compared to only 3.8 among the 30-34 year age cohort.

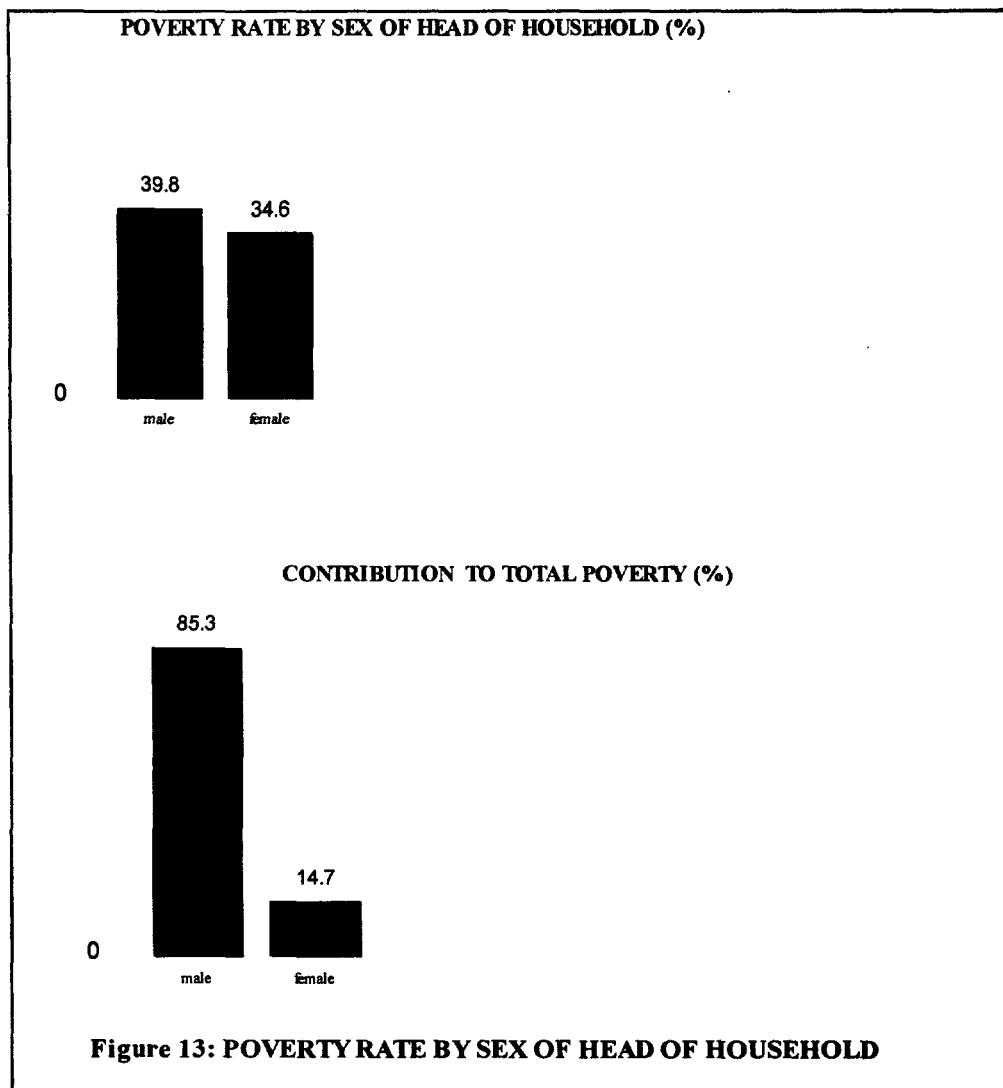


Poverty Comparisons by Gender

The status of women, who in most developing countries are disadvantaged in comparison with men, is an important policy concern. One indicator of the gender gap is whether female-headed households are worse off than those headed by males. This might be expected to be a major concern in Cambodia since nearly 20 percent of the population live in households headed by women. In fact, the SESC data show that female-headed households in Cambodia are *less* likely to be poor than male-headed households⁶, and this holds regardless of the poverty line and poverty index used. Although people living in female-headed households account for nearly 23 percent of the population, they account for only about 15 percent of the poor. Put another way, using the benchmark poverty line about 40 percent of individuals in male-headed households are poor, but only 35 percent

⁶ Households headed by women include a wide variety of living arrangements, such as households where a woman is simply given as the reference person in the household, multigeneration households where the oldest person is given as the head, and households consisting of women and children only. It is the latter category that is especially vulnerable to poverty because of the low ratio of workers to dependents. Since female headship covers all categories, it is not a very sensitive indicator of vulnerability to poverty. Further research into the structure of female headed households is needed to identify which are most at risk.

of individuals in female-headed households have this characteristic. Overall, while women and girls in Cambodia may be disadvantaged in a variety of ways, it is not the case that female-headed households are generally more vulnerable to poverty than those headed by males; in fact the opposite seems to be the case.



6. INTERNATIONAL POVERTY COMPARISONS

Is Cambodia poorer or better off than other East Asian countries in terms of the proportion of the total population in poverty? Precise comparisons between Cambodia and other countries are precluded by the fact that a large part of the country was excluded from the SESC sample frame. Nevertheless it is possible to compare the regional Cambodian estimates with corresponding estimates from other countries for which poverty estimates have been made using a comparable methodology for setting poverty lines. Comparable poverty estimates for Vietnam, Laos and Indonesia are summarized in Table 9. These comparisons suggest that the incidence of rural poverty in Cambodia (43 percent) is lower than among its Indochina comparators -- Vietnam (47 percent) and Laos (53 percent). But rural poverty in Cambodia remains considerably higher than elsewhere in East Asia, taking Indonesia as an example (24 percent). However, it must be borne in mind that rural poverty in Cambodia may have been underestimated by the exclusion of significant portions of the countryside from the SESC sample. On the other hand, urban poverty appears to be slightly higher in Cambodia (24 percent) than among its Indochina neighbors -- Vietnam (20 percent) or Laos (24 percent) - and much higher than Indonesia (10 percent). These international comparisons emphasize that the magnitude of the development gap which remains to be closed between the economies in Indochina and the rest of East Asia, while suggesting that Cambodia's starting point is not very different from its neighbors in Indochina.

Table 9: International Poverty Comparisons

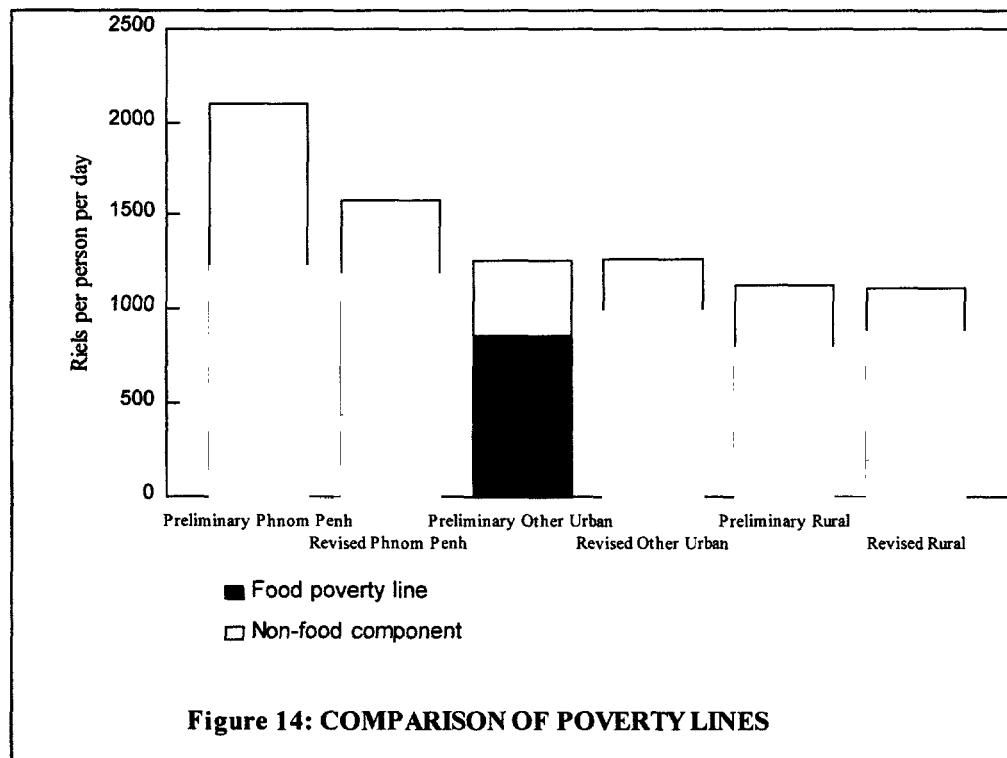
	Head count index (%)			Poverty Gap (%)			Severity index (%)		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Food poverty line									
Vietnam	9.9	28.2	24.5	2.0	6.2	5.4	0.6	2.1	1.8
Laos	7.6	26.0	21.6	1.0	5.5	4.4	0.2	2.0	1.6
Indonesia	2.8	10.7	7.9	0.31	1.26	0.97	0.06	0.23	0.18
Cambodia	12.9	21.9	20.0	2.9	4.0	3.7	0.93	1.1	1.1
Poverty line									
Vietnam	19.6	46.5	41.2	4.5	12.4	10.8	1.6	4.7	4.1
Laos	23.9	53.0	46.1	4.5	14.4	12.1	1.2	5.6	4.6
Indonesia	10.2	23.6	19.6	1.67	4.25	3.5	0.40	1.08	0.87
Cambodia	24.2	43.1	39.0	6.4	10.0	9.2	2.4	3.3	3.1

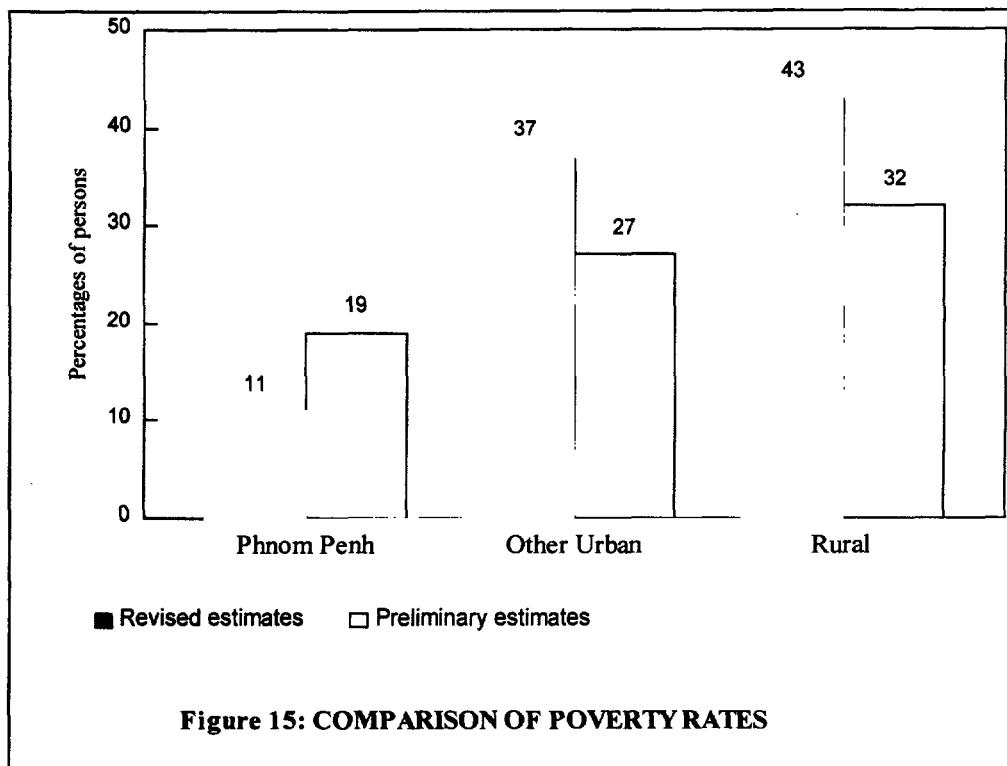
Source: World Bank Documents. Vietnam estimate based on 1992-1993 household survey. Laos estimate based on 1992-1993 survey. Indonesia estimate based on 1990 Susenas household survey.

7. COMPARISON WITH OFFICIAL POVERTY ESTIMATES

The First SocioEconomic Development Plan reports official estimates of poverty in Cambodia. These estimates were constructed using summary tabulations of the household expenditure distribution from the SESC 1993/94. This report provides a revised version of these estimates by using the detailed individual records from the full SESC dataset. This section compares the revised estimates with those presented in the Plan and explains why they are different. The main differences between the revised and the Plan estimates are highlighted in Figures 14 and 15.

As shown in Figure 14, the revised poverty line for Phnom Penh is 25% lower, while the revised poverty lines are similar in both the Other Urban and Rural areas. The resulting poverty rates (head count indices) are given in Figure 15. These show that the revised poverty rate for Phnom Penh is lower, while the revised poverty estimates for Other Urban and Rural areas are much higher. The nature and implications of these two differences -- in the poverty lines and in the ranking method -- are explained below:





Differences in Poverty Lines

The **food poverty lines** are based on a similar methodology, using a basket of food items valued at local prices. The main technical differences lie in how the methodology is implemented in constructing the line:

- benchmark daily calorie requirement – the Plan estimates used a higher calorie benchmark of 2,200 per day,
- composition of the reference food bundle – the bundle used in the Plan estimates consisted of only 7 products including rice, vegetables, pork, fish and oil, with relative quantities based on expenditure patterns in the third quintile of the household (not individual) consumption distribution;
- pricing the reference food bundle -- the starting point in the Plan estimates are the prices prevailing in Phnom Penh. The valuation of food bundles for Other Urban and Rural areas is done by assuming that food prices in Other Urban are 70 percent of those prevailing in Phnom Penh, while food prices in Rural areas are 65 percent. However, the revised estimates are based on the observed unit values of cash purchases in each region. For Phnom Penh the revised price estimates are very close to the Plan estimates, while prices in Other Urban and Rural areas are much higher. Overall the observed price differential between Phnom Penh and other areas is much less than was assumed -- in

the revised estimates, the spatial food price deflators -- with Phnom Penh at 100 -- are 84 in Other Urban and 74 in Rural areas.

The methods used in constructing the **non-food allowance** were quite different. The Plan estimates were based on a basket of non-food items. The basket contained an allowance for firewood, medical expenses, education, clothing, transport and housing. The allowances for Other Urban and Rural were set to a lower level compared to Phnom Penh. The revised estimates were derived from the observed non-food consumption of those households at the food poverty line. In general, the Plan estimates yield much higher values for the non-food allowance. The difference is greatest in Phnom Penh, which was assigned a daily non-food allowance of 477 Riels per day higher than in the revised estimates.

Differences in Ranking Method

Given that the poverty lines are not very different for the Other Urban and Rural areas it seems surprising that the headcount indices for these regions turn out to be much higher in the revised estimates. This difference is simply due to the fact that the Plan estimates are derived from summary tabulations in which households were ranked on the basis of total household consumption -- instead of the distribution of per capita consumption over the individual records of household members as was used in the revised estimates. As a result, the poorest deciles of the household consumption distribution contained a relatively large number of small households with few income earners. Although these households appear to be relatively poor if judged on the basis of their total household consumption, this is not necessarily so when the distribution of household members is sorted in ascending order of per capita consumption. In fact, experience from other countries shows that usually the households which are ranked as poor in per capita terms tend to be relatively large. The Plan estimates did attempt to take this into account by dividing the means of total household consumption by the average family size per decile. However, this did not change the underlying ranking of households in the distribution across deciles.

Decomposition of Differences

relative effects of these two differences on the headcount index are decomposed in Table 10. This decomposition is shown in two stages. The **first-stage decomposition** takes the official poverty estimates -- using the Plan poverty line and the household ranking method -- as the benchmark for comparison. The first-stage adjustment then switches the ranking method from a household basis to a per capita basis while retaining the Plan poverty line. This shows that the large difference in the poverty estimates for Other Urban and Rural areas is almost completely driven by the difference in the ranking method. Switching to per capita rankings with the Plan poverty line would raise poverty by 10% in Other Urban areas (to 37%) and by 12% in Rural areas (to 44%). In this case using household level data turned out to be an unfortunate approximation. In Phnom

Penh, however, the error made by using the summary tabulations at the household level is not that large since household size exhibits little variation in this city. Thus, the first-stage adjustment would have raised poverty incidence in Phnom Penh by only 3% (to 22%). The **second-stage decomposition** changes the benchmark to the poverty estimates generated using the Plan poverty lines combined with the correct per capita ranking method. The second-stage adjustment then switches from the Plan to the revised poverty lines in order to identify the poverty line effect. This shows that the lower poverty estimate for Phnom Penh is primarily due to differences in the poverty line. The estimated incidence of poverty in Phnom Penh falls in half, to only 11%. Meanwhile, there is no further change in the poverty estimates for Other Urban areas (at 37%), and only a 1 percent change in Rural areas (to 43%).

Table 10: Decomposition of Difference in Poverty Estimates

Poverty Line	Ranking method	Headcount index		
		Phnom Penh	Other Urban	Rural
Revised poverty line	Per capita	11	37	43
Difference due to poverty lines /b		-11	0	-1
Plan poverty line	Per capita	22	37	44
Difference due to ranking method /a		+3	+10	+12
Plan poverty line	Household	19	27	32

/a Using plan line/household ranking as the benchmark for comparison;

/b Using plan line/per capita ranking as the benchmark for comparison;

8. CHARACTERISTICS OF THE POOR

While the consumption-based measures of poverty are a convenient yardstick for measuring the distribution of living standards in the Cambodian population, they do not fully capture other characteristics of the poor such as literacy, health, or access to clean water. This section gives a brief overview of the distribution of selected non-monetary indicators of household living standards, using data collected by the SESC (see Table 11).

Household Composition. Household composition, in terms of the size of the household and the characteristics of its members, is often quite different for poor and non-poor households. Table 11 shows household size and the age of the family members by expenditure quintiles. The poor do tend to live in larger households, with an average family size of 6.6 persons in the poorest quintile compared to 4.9 in the richest quintile. The poor also tend to live in younger households -- with twice as many children under age 15 per family (3.4) in the bottom than in the top quintile -- and slightly fewer elderly people over age 60. Better-off households tend to have heads that are somewhat older, but the difference across quintiles is very small.

Literacy and Schooling. Literacy and schooling are important indicators of the quality of life in its own right, as well as being the key determinant of the poor's ability to take advantage of income-earning opportunities. Cambodia has achieved a (self-reported) basic literacy rate averaging 67 percent of adults older than 15, implying a high degree of literacy among the poor. The literacy gap which remains is quite large, with literacy ranging from just over half of adults (58 percent) among the poorest 20 percent of the population to 77% percent among the richest. Much larger differentials appear in the distribution of school attainment. Years of schooling among adults aged over 15 average only 3.1 years in the bottom 20 percent of the population, increasing to 5.3 years of schooling among the richest 20 percent. Here there is a very large gender gap, with mean grade attainment among men of 5.1 years compared to 3.2 years among women.

Housing Conditions and Assets. Housing conditions are another important element among different aspects of social well-being. Water and sanitation are especially important influences on health and nutrition status. The SESC shows that the poor are extremely disadvantaged in access to safe sources of water supply and sanitation. Only 4 percent of the poorest quintile have access to piped **water**, while more than 17% of the richest quintile do. Similar differences are apparent in access to **sanitation**. Few of the poor – 9% -- have access to a toilet in the home, while around half of the richest 20 percent do. Another indicator of housing standards is access to electricity. Here again the access of the poor lags far behind. Access to **electricity** from a generator or line connection --the most convenient energy source -- rises sharply with income, from a mere

1% among people in the bottom quintile to 37% of Cambodians in the richest quintile. Table 13 above also indicates the percentage of households that possess **bicycles and motorized transport**. Access to bicycles is quite evenly distributed with at least one half of households owning a bicycle in every quintile, even the poorest. However access to cars, jeeps or motorbikes is very rare among the poor and rises sharply with income. Overall, the shift from bicycles to motorized transport is a strong indicator of better off families with access to a wider variety of services and amenities.

Table 11: Decomposition of Differences in Poverty Estimates

	Total	Quintile /a					Domain		
		Poorest	2	3	4	Richest	Phnom Penh	Other Urban	Rural
Household size	5.6	6.6	6.0	5.7	5.0	4.9	5.9	5.9	5.5
Children per family (age 0-14)	2.4	3.4	2.8	2.5	1.9	1.8	2.3	2.6	2.4
Elderly per family (age 60+)	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3
Dependency disabled /b	0.84	0.78	0.93	0.93	0.91	0.68			
Age head of household	44.6	44.1	43.0	44.1	45.2	46.1	45.0	45.3	44.5
Female head of household(%)	21.2	18.6	17.3	18.9	23.3	26.6	25.8	23.4	20.4
Literacy (% adult aged 15+)	66.6	57.7	64.3	66.2	67.9	77.1	81.8	72.5	63.7
Years of education (avg. adult aged 15+)	4.0	3.1	3.7	3.8	4.2	5.3	6.1	4.7	3.7
Years of education /c (avg. male aged 15+)	5.1	4.1	4.7	4.8	5.4	6.6	7.3	5.8	4.7
Years of education /c (avg. male aged 15+)	3.2	2.4	2.9	3.0	3.3	4.3	4.9	3.8	2.8
Access to piped water (%)	7.1	4.3	3.4	3.5	5.5	16.7	33.6	13.4	2.9
Toilet in house (%)	22.1	8.7	11.3	13.9	21.1	48.7	78.0	46.7	11.7
Electricity from line or generator(%)	12.4	1.3	2.1	5.5	10.4	36.8	67.4	30.2	3.0
Radio (%)	27.7	23.0	25.1	25.8	29.8	33.0	38.7	31.4	25.9
TV (%)	13.8	3.0	4.8	7.0	12.7	35.9	57.0	21.6	7.2
Bicycle(%)	60.9	57.7	65.3	63.6	61.6	56.8	41.1	60.9	63.5
Car, jeep or motorcycle(%)	18.0	6.4	6.7	11.7	18.8	40.5	58.8	27.1	11.6

/a Quintile distribution based on real per capita expenditure using the implicit food poverty line price deflators;

/b Dependency defined as number of disabled in family divided by number of family members times 100.

/c Averages over all individuals aged 15 and above. All other variables are averages across households.

9. IMPROVING POVERTY ANALYSIS AND POLICY

Adequacy of the Information Base

Poverty reduction is a central goal of the Royal Government of Cambodia. The policy relevance of the poverty profile for Cambodia based on SESC 1993/94 illustrates the importance of adequate data from large-scale household surveys in analyzing poverty and designing appropriate policies to translate the Government's commitment to policy reduction into action. These data are essential to help government policymakers to:

- identify the regional location, employment, gender and other characteristics of the poor in order to support design of more efficiently targeted poverty alleviation programs;
- monitor changes in poverty over time so as to assess the pace and pattern of development progress;
- analyze the levels and determinants of access to economic infrastructure and support services, as well as to access to social services and safety nets – many of which are publicly provided or subsidised -- as a guide to improving the effectiveness of policy instruments intended to enhance the welfare of the poor.

The Government has already taken important ad hoc steps towards developing a capacity to collect and analyze poverty-related survey data on a regular basis. The first Socioeconomic Survey of Cambodia 1993/94, which was originally designed to establish the weights for a new consumer price index, has demonstrated the capacity to implement a large-scale income and expenditure survey on a sample of around 5,000 households in 16 provinces. The ongoing second Socioeconomic Survey of Cambodia 1996 has adopted a completely different questionnaire design focusing on welfare indicators in selected areas such as child labor, nutrition status and coverage of child health programs, housing characteristics, land tenancy and credit behavior. This second survey was designed to accommodate the data needs expressed by users in a variety of sectors for which funding could be mobilised. It will be carried out on a larger sample of 9,000 households, with oversampling to give province-level estimates in 8 provinces.

These initial efforts have made an important contribution to capacity building at the National Institute of Statistics and it is important that they should be sustained. Three significant limitations will need to be overcome in future development of the information base on living standards in Cambodia. The first is that neither of the SESC questionnaires implemented to date have been explicitly designed as a fully integrated **multipurpose** survey of the type needed to conduct a comprehensive poverty assessment for policymakers. For example, while the expenditure data collected by SESC 1993/94

generate a detailed picture of the distribution of per capita consumption, it is not possible to analyse levels or determinants of access to social services among the poor because the survey did not simultaneously collect data on education enrollments or utilisation of health services, nor did it collect data on the price of obtaining access to these services. The SESC 1996 goes to the other extreme. While extensive data are collected on nonmonetary indicators such as child nutrition or immunisation coverage, only limited information will be collected on household consumption expenditure so that interrelations with poverty status may not be clearly identified.

Second, neither of the SESC surveys are able to support nationwide geographic **disaggregations** of key variables such as per capita expenditure and poverty incidence at the provincial level. In practice, this imposes an important limitation on its potential use in project planning. The need to overcome similar limitations in other countries have led to the adoption of much larger sample sizes. For example, the annual core household survey in Indonesia is now administered to over 200,000 households. Similarly, Vietnam now uses a sample of 45,000 households for the annual multipurpose survey. These enhancements are intended to provide much finer identification of the geographic location of poverty problems, support the design of more efficiently targeted poverty alleviation programs and strengthen capacity for decentralized planning at the provincial level.

Third, the SESC surveys have not yet been **institutionalized** as part of a systematic, long-term and regular effort to evaluate the extent and nature of the poverty problem in Cambodia, to monitor progress in poverty reduction over time, and to evaluate the effectiveness of specific targeted antipoverty interventions. This means there is a risk that the potential benefits of these surveys will be short-lived. If the investments which have been made in creating new skills in survey design, field procedures, data processing methods, policy analysis and program design are not maintained continuously then future surveys will become much more difficult to implement.

The importance of consolidating and sustaining these nascent efforts to strengthen the information base for policymaking on poverty is increasingly recognized in neighbouring countries. For example, in the early 1990s Indonesia initiated a major collaborative effort between the planning and statistics agencies to redesign its national household survey system (SUSENAS) to provide better data to guide the country's poverty alleviation programs. China is planning to set up a Poverty Monitoring and Evaluation System with the same objective. Recently Vietnam introduced an annual series of large-scale multipurpose household surveys of living standards.

Institutionalising Poverty Analysis and Policy

The agenda for institutionalizing poverty analysis and policy in Cambodia embraces four key elements. First, the government should consider adopting routine implementation of a new national household survey which offers both multipurpose

coverage and geographic disaggregation. This calls for a two-part “**core/module**” household survey design.

The purposes of the core are to support monitoring of changes in key indicators over time, and identification of priority areas for geographic targeting of development programs. To serve these needs, the contents of the core questionnaire could be fixed on a small number of key welfare indicators, e.g. per capita consumption, education enrollment, health care utilization rates, and the questionnaire would be implemented relatively frequently -- probably every year -- on a large sample so as to give estimates of the indicators disaggregated at least to provincial level. At the same time the core could be supplemented every year with a rotating sector module.

The purpose of the modules would be to support in-depth analysis of sectoral issues and policies, such as the effects on the poor of changing pricing policies in the social sectors. Given the focus of the modules on analysis rather than monitoring, individual sector modules need not be carried out every year or on a large sample. Instead they could rotate over a 3 year cycle on a subsample of the core – for example, a social sector module, followed by an income and employment module, and then a detailed consumption module.

The core/module survey of households needs to be linked to a community survey conducted at the village level. The purpose of the community survey is to collect data on variables which affect all households in the community, such as public/private provision of economic infrastructure (e.g. land, irrigation, agricultural extension, roads and markets) and social services (e.g. availability and quality of schools and health services). Thus the community survey plays an essential role in analysing determinants of household behavior and welfare based on merged datasets using the community and household data. Ultimately the community survey can also play a role in poverty monitoring for targeting purposes. This requires implementation of the community survey on a census basis. For example, in 1993 the government of Indonesia prepared a nationwide poverty map identifying poor villages based on data collected in the community survey (Potensi Desa or PODES) which is administered to all villages every three years. This poverty map has become the operational basis for targeting a major poverty alleviation program, comprising decentralised grants to poor villages. In addition, the poverty map has focused geographic targeting of many other government programs in different sectors.

A second key element of the future agenda is to improve the **institutional linkages** between the National Institute of Statistics as the technical agency responsible for the quality of data production, and its client policymakers in the Ministry of Planning and the relevant line agencies. In order to make effective use of the household survey database, the clients need to perceive it to be useful by contributing to design of the content of the surveys so that they are responsive to key policy questions.

A third factor which conditions the strength of institutional linkages is **timeliness** of turnaround from the surveys. Improving the speed of data processing, availability and dissemination to users in the government would probably require significant enhancement in PC-based computing capacity at the National Institute of Statistics.

Finally, for Cambodia to benefit fully from these improvements in the design, regularity and turnaround in the information base on living standards will require continuing improvements in the analytical skills of policymakers and researchers in Cambodia through a combination of training and hands-on experience. Meeting this objective demands a new effort to train staff in methods of **applied policy analysis** in government agencies.

An Integrated Household Survey System

Development of an integrated household survey system using a core/module design would need to be sustained over a multiyear period. The full cycle would last at least three years to allow for the necessary expansion in sample size, refinements of survey design, and capacity building in operational procedures. At the end of this period the National Institute of Statistics would have implemented all the components of a fully integrated multipurpose household survey system, and should be prepared to maintain it on a routine basis.

At this early stage of development of the National Institute of Statistics, scheduling of the proposed household survey series will need to take into consideration other operational commitments. Preparatory work on the population Census has already started with a view to field implementation in March 1998, before the General Elections which are scheduled to take place in May 1998. Surveys undertaken in 1998 and 1999 will benefit from the improved household listing frame developed for the 1998 Census. A feasible implementation schedule might be as follows:

- First Survey, 1997 (July):
 - design: stratified sample in one round;
 - sample size: around 5,000 households to provide regional and urban/rural estimates for core variables;
 - scope: core questionnaire plus “social sector” module plus village survey administered to the module subsample;
- Second Survey, 1998 (after May):
 - design: stratified sample in one round;

- sample size: increased >6,000 households to allow selected provincial estimates of core variables;
- scope: core questionnaire plus “income and employment” module plus village survey in core sample;
- Third Survey, 1999:
 - design: stratified sample in one round;
 - sample size: increased to 15,000 households to allow complete provincial estimates of core variables;

scope: core questionnaire plus “consumption” module plus expanded village survey administered on a census basis.

A Poverty Analysis and Policy Unit

Ultimately the operational value of improving the poverty related information base provided by the integrated household survey system will depend on the capacity to analyse the data and interpret its practical implications for policymakers. This capacity needs to be located within the Ministry of Planning because of the complex cross-sectoral agenda involved in formulation of antipoverty policies, and the need to interact with policymakers involved in setting strategic priorities between and within different sectors. Several other countries have adopted this approach. For example, in Indonesia the World Bank is currently financing a Social Sector Capacity Building Project implemented by the planning ministry (BAPPENAS). The project establishes a technical advisory capacity managed by BAPPENAS and linked to the line ministries. The scope of work ranges from informal policy notes to research studies linking government policies to household behavior and welfare. The necessary technical skills place a strong emphasis on public finance, microeconomics and econometrics.

Donor Coordination

International donors are committed to supporting the poverty reduction goal set forth in the First Socioeconomic Development Plan, and all share a common interest with the government in strengthening the information base on living standards in Cambodia so as to improve the policy dialogue on sectoral priorities and project design. Accordingly, the donors are working together in mobilising the external financing required to implement the joint work program on data collection and policy analysis which will be necessary to underpin the government’s policy commitment to fight poverty. UNDP has taken the lead in coordinating this effort in the framework of a new project on Capacity Development for Socio-Economic Surveys and Planning.(CMB/96/019/A/01/42).

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ANNEX A

CIVIL SERVANTS, POVERTY AND EARNINGS

The poverty comparisons between different employer categories suggest that people living in households in which the household head works for the government are the least likely to be poor in Cambodia (see Section E, para 37). This finding reflects the distribution of per capita expenditure between government and other households. For example, per capita consumption in government households averages 56% higher than in private sector households (see Table 1). It is important to note that this differential is also seen on the income side: on average per capita income is 25% higher in government than private sector households. Note that self-employed households are excluded from these comparisons because individual earnings data are not available for these households.

Table A.1: Comparisons Of Public/Private Sector Workers

	Private Sector Wage Worker			Public Wage Worker		
	all	without second job	with second job	all	without second job	with second job
Per capita household consumption (in Riels/day)	2,134	2,649	1,354	3,247	3,634	2,601
Wage in primary job of head of household (in Riels/day)	4,265	5,299	2,666	2,130	2,523	1,479
Per capita household income from all sources	1,476	1,780	1,014	1,839	2,135	1,347
Number of workers in household (including head of household)	1.95	1.95	1.94	2.15	2.17	2.12
Household size	5.8	6.0	5.5	6.3	6.2	6.4

This Annex seeks to explain why civil servants tend to be better off in terms of per capita consumption than other employment groups in Cambodia. The explanation is sought in understanding the structure of employment and earnings as reflected on the income side of the data collected by SESC 1993/94. Note, however, that the ability of the income data used in these comparisons to explain the poverty differentials implied by variations in consumption expenditure is quite limited.

The limitations of the SESC data are evident in the simple fact that reported household incomes are considerably lower than the levels of consumption expenditure reported in the survey. Thus, for people living in households headed by a government worker, reported income per capita is equivalent to only 57% of consumption per capita. Among 'private sector' households per capita income is only 69% of reported consumption (see Table 1). Obviously, the income data can only be used to explain the variations which are actually observed in the reported incomes. Since the variance in incomes apparently accounts for only part of the observed variation in consumption, any insights gained from analysing the reported income data will necessarily be incomplete.

Sources of Income: Monetary and Nonmonetary

In order to understand why income differentials are observed between public and private sector households it is useful to begin by identifying the main components of income which are actually responsible for this difference in aggregated income levels (see Table 2). Overall, the per capita income differential is Riels 363 per day: the difference between Riels 1,839 per day in government and Riels 1,476 in private sector households. Disaggregation by the main sources of income shows that this differential originates entirely on the nonmonetary income side: per capita income from the group of nonmonetary income sources is Riels 435 per day higher among government workers.

What, then, are the sources of this difference in nonmonetary income? Further disaggregation shows that nearly all of the difference can be attributed to nonrental income. Nonrental income averages Riels 313 per day more among government workers. This alone accounts for over 85% of the overall difference in per capita income.

Although the value of income generated by monetary sources is slightly lower among public sector workers, it is worth noting that actual wage income seems to be much lower – around one half as much as earned by private sector workers. However this adverse wage differential is substantially offset by relatively high incomes from business and other cash sources.

Other Factors

Moonlighting. Given that average daily earnings from the main job are only 50% as high in government employment than in the private sector (Riels 2,130 per day compared to Riels 4,265 per day), one might expect that civil servants would moonlight in order to compensate with earnings from secondary jobs.

Surprisingly, however, the data do not give any support to the moonlighting hypothesis. First, sizeable differentials in per capita income are observed between government and private sector households whether or not the head has a secondary job (see Table 1). And second, the probability of holding a second job is the same—28%—in both the public and private sectors. In other words, multiple jobbing among

Table A.2: Structure Of Income By Source And Occupation
 (in Riels per capita per day)

	Private sector	Public Sector
All sources	1,476	1,839
Monetary	1,141	1,068
Wages	833	446
Pensions	3	3
Other cash incomes	20	138
Business	161	412
Agricultural	124	69
Non-monetary	335	770
Agricultural	21	67
Rental	240	553
In kind	38	22
non agricultural	37	129

household heads who work for the government does not appear to be a significant factor raising their per capita income and consumption.

Educational Attainment. Another possible explanation of the observed income differentials lies in average educational attainment of households where the head works for government or the private sector.

In contrast to the pattern of earnings differentials, however, the average years of education turns out to be significantly higher among working age members of government households, whether they are household heads or not (see Table 3).

Table A.3: Educational Attainment In Public/Private Sector Households
 (average years of education)

	Government worker	Private sector worker
Household head	7.95	5.55
Other (non-head) adults (15+)	5.3	4.0
Other adults who are working	5.2	4.3
Other adults who are not working	5.9	4.0
Percent of heads with a second job	28	28

The positive role of education in explaining per capita income differentials across households is reflected in the Mincerian earnings function shown in Table 4. This does show the expected positive coefficient on years of education, as well as the higher earnings levels associated with residence in urban areas. However the favorable effect of education is clearly counteracted by the negative effect of being a government worker.

Table A.4: Log Earnings Regression

	Coefficient	T-statistic
Constant	6.690	40.83
Female	-0.189	-4.86
Age	0.056	5.96
Age squared	-0.068	-5.56
Years of education /100	0.019	3.91
Government worker	-0.730	-18.32
Phnom Penh	0.342	9.14
Other Urban	0.229	5.45
R squared	0.17	

ANNEX B

ANALYSIS OF GENDER-POVERTY LINKAGES

The living standards of female-headed households are often used as an indicator of the status of women, and female-headship is commonly believed to be a useful targeting indicator for antipoverty programs. Female headship is relatively common in Cambodia compared to other developing countries -- female-headed households account for 21.3% of total households included in the SESC sample. In the great majority of these households —accounting for 75% of all female-headed households, or 16.1% of total households—the female head is unmarried and belongs to the oldest generation living in the household (see Table 1).

Table B.1: Characteristics Of Family Headship
(individuals aged > 18 years)

Cell description				Cell characteristics		Contribution to total heads (%)
sex	generation /a	married	% share of total	family size	% head of household	
male	1	no	1.2	5.6	58.0	2.0
	1	yes	25.4	5.8	94.9	68.6
	2	no	8.1	6.7	0.7	0.2
	2	yes	5.3	7.2	53.6	8.0
	3	no	2.7	7.5	0.0	0.0
	3	yes	2.1	7.7	0.0	0.0
female	1	no	8.3	4.9	68.3	16.1
	1	yes	25.6	5.8	3.8	2.8
	2	no	10.2	6.4	6.9	2.0
	2	yes	6.5	7.2	2.0	0.4
	3	no	3.5	7.2	0.0	0.0
	3		1.1	7.8	0.0	0.0
Total				100.0	100.0	

/a The definition of generation is based upon the family relations prevailing in the household. The first generation is defined as the oldest generation living in the households. Individuals are assigned to the second generation if a previous generation--their parents--is present in the household. Third generation members exist if the grandparents of children live in the households --in that case the children would be classified as third generation. The third generation is also used as an 'other' category -- it includes servants and non-family related household members.

As shown in the main text (section E, para 40) the evidence from SESC 1993/94 does not support the policy inference that female-headed households are a high-poverty target group in Cambodia. On average, female-headed households are less likely to be poor than male-headed households. This finding reflects the fact that per capita consumption expenditure is generally about 19% higher among female-headed households: Riels 2,075 per day compared to Riels 1,748 per day (see Table B.2). This finding is only reversed in the special case where female heads are the only person working in the household; however, this constitutes only a small minority--12.6%--of all female-headed households (which, in turn, account for only 21.3% of all households).

Table B.2: Per Capita Consumption And Household Headship
(per capita household consumption expenditure in Riels per day)

Characteristics of Household Head	Male		Female	
	mean	% share	mean	% share
Not working	1,865	6.8	2,094	21.3
Only worker	2,153	0.3	1,793	12.6
With other workers	1,776	92.9	2,123	66.1
Total	1,748	100.0	2,075	100.0

In interpreting the policy significance of the female headship data, it is very important to recognise that female headship is an empirically narrow, and therefore potentially misleading, index of the living standards of women in general. The reason is simply that the great majority of Cambodian women—79%—do not live in female-headed households (see Table B.3). Thus focusing on female-headed households alone simply ignores the welfare of most women in Cambodia.

Table B.3: Distribution Of Females By Family Headship
(in percent)

Headship	Females		
	Young	Working age	Total
Male	39	40	79
Female	8	13	21
Total	47	53	100

For this reason, an adequate assessment of gender-poverty linkages requires going beyond the narrow concept of female headship to a broader index which reflects the welfare of the majority of females living in Cambodia. Using per capita expenditure as the basic indicator of living standards, the obvious step to begin with is to examine the correlation between per capita consumption standards and the “femaleness” of the

households in which people live. Here, “femaleness” is measured by the percentage of working-age (15-60 years) household members who are women.

Simple cross-tabulations of the grouped data do not show any relationship between the index of femaleness and consumption standards (see Table B.4). Very wide variations in the level of per capita expenditure across quintiles coexist with virtually no variation in the femaleness of household workership. The femaleness of the household labor force averages 55% in the whole population – and hardly varies from 56% in the poorest quintile to 54% among the richest 20% of the population.

Table B.4: Distribution Of Femaleness By Expenditure Quintile
(females as % of all working age household members)

Consumption quintile	Index of Femaleness
1—Poor	55.8
2	56.4
3	56.3
4	55.0
5 –Rich	53.5
Total	55.4

Multivariate regression analysis provides a more robust test of the hypothesis that higher femaleness of the household labor force is associated with lower per capita expenditure, while controlling for the influence of other relevant household characteristics such as location of residence, the average level of education of working members of the household, and the dependency ratio. The results of the loglinear specification of this relationship are given in Table B.5.

Table B.5: Determinants Of Household Welfare
(Dependent variable: log per capita consumption)

	Coefficient	T- statistic
Constant	7.17	214.98
Dependency ratio	-0.64	-17.88
Femaleness	0.15	3.97
Phnom Penh	0.86	45.65
Other Urban	0.23	11.63
Years of education (average over all adults in family)	0.06	21.07
R squared	0.47	

As expected, these findings indicate that higher dependency ratios reduce living standards, while urban location (particularly Phnom Penh) and years of education exert

strong positive effects on consumption standards. It is noteworthy that these powerful results reject the hypothesis of a negative effect of femaleness--instead, greater femaleness has a positive and statistically significant on per capita consumption. The femaleness elasticity of per capita expenditure is 0.15—thus, a 10% higher female proportion of the household work force is associated with a 1.5% higher per capita consumption standard. These findings show that the indicators which matter in targeting households with lower living standards are rural residence and low educational achievement regardless of sex, not femaleness per se.

ANNEX C

POVERTY TABLES

Table C.1: Distribution of Poverty By Sector of Employment of Head of Household

Sector	Head Count Index			Poverty Gap		Severity Index	
	distr. (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
Agriculture and fishing	62.7	45.9	73.8	10.6	72.0	3.5	70.3
Hotels and restaurants	7.1	24.3	4.4	6.8	5.2	2.7	6.1
Government	6.4	20.1	3.3	4.8	3.3	1.5	3.1
Transport	4.7	31.6	3.9	7.2	3.7	2.3	3.6
Education Health	3.9	22.7	2.3	4.8	2.0	1.7	2.1
Manufacturing and mining	3.7	21.9	2.1	4.7	1.9	1.7	2.0
Construction and utilities	1.5	37.0	1.4	9.4	1.5	3.2	1.5
Other	1.1	29.4	0.8	8.1	1.0	3.1	1.1
Not reported	8.9	35.0	8.0	9.6	9.3	3.5	10.2
Total	100	39.0	100	9.2	100	3.1	100

Table C.2: Distribution of Poverty By Employer Head of Household

Employer	Head count index			Poverty Gap		Severity index	
	distr. (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
Self employed	75.2	42.0	81.1	9.7	79.5	3.2	78.3
Public sector	11.8	20.5	6.2	4.5	5.8	1.4	5.4
Family worker	8.9	35.0	8.0	9.6	9.3	3.5	10.2
Private sector	2.4	36.2	2.2	10.2	2.7	4.2	3.3
Household worker	1.7	57.3	2.5	15.2	2.8	5.3	2.9
Total	100	39.0	100	9.2	100	3.1	100

Table C.3: Distribution of Poverty By Education Head of Household

Education	Head count index			Poverty Gap		Severity index	
	distr. (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
None	23.2	47.1	28.1	12.3	31.1	4.5	33.4
Primary	42.7	40.6	44.4	9.6	44.4	3.2	44.0
lower secondary	22.7	31.7	18.5	6.8	16.7	2.1	15.6
higher secondary	8.0	30.1	6.1	6.1	5.3	1.9	4.7
graduate	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Not reported / Unknown	2.8	40.6	2.9	8.3	2.5	2.5	2.3
Total	100	39.0	100	9.2	100	3.1	100

Table C.4: Distribution of Poverty By Literacy Head of Household

Literacy	Head count index			Poverty Gap		Severity index	
	distr. (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
Can read & write	72.3	36.4	67.5	8.2	64.5	2.7	62.0
Cannot read & write	27.7	45.7	32.5	11.8	35.5	4.3	38.0
Total	100	39.0	100	9.2	100	3.1	100

Table C.5: Distribution of Poverty By Sex Of Head of Household

Sex	Head count index			Poverty Gap		Severity index	
	distr. (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
Male	83.5	39.8	85.3	9.4	84.9	3.1	84.6
Female	16.5	34.6	14.7	8.4	15.1	2.9	15.4
Total	100	39.0	100	9.2	100	3.1	100

Table C.6: Distribution of Poverty by Family Size

Household size	Head count index			Poverty Gap		Severity index	
	distr. (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)	index (%)	contribution to total (%)
1	0.2	1.0	0.0	0.1	0.0	0.0	0.0
2	2.3	11.1	0.7	2.2	0.5	0.6	0.5
3	6.3	18.5	3.0	3.3	2.2	0.9	1.9
4	11.0	26.5	7.5	5.0	6.0	1.4	5.0
5	14.5	34.2	12.7	7.1	11.2	2.2	10.5
6	17.3	40.3	17.8	9.1	17.1	3.0	16.4
7	15.7	46.7	18.8	11.1	19.0	3.8	19.0
8	13.3	44.5	15.1	11.4	16.5	4.1	17.3
9	9.1	49.8	11.6	13.2	13.1	4.8	14.0
10	5.1	51.9	6.8	13.1	7.3	4.7	7.7
11	2.7	40.4	2.8	11.9	3.5	4.3	3.7
12+	2.5	47.9	3.1	12.8	3.5	4.9	4.0
Total	100	39.0	100	9.2	100	3.1	100

ANNEX D

REFERENCE FOOD BUNDLE

Table D.1: The Reference Food Bundle

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Beverages							
Instant coffee	100 gms	129 (*)	733	700	560		0,301
Ground coffee	100 gms	129 (!)	700	817	600		0,193
Powdered tonic drinks	100 gms	350 (*****)	1350	1100	1100		0,000
Processed cocoa	100 gms	392 (*)	800	800	800		0,061
Tea leaves/dust	100 gms	300 (*)	800	500	600		8,692
Other tea	tea bags	0 (*)	800	800	700		3,039
Canned soft drinks	cans	142 (**)	1500	1300	1300		0,000
Bottled soft drinks	bottles	90 (**)	1225	2750	1450		0,153
Other types of soft drinks		100 (*****)	1000	1000	1000		0,125
Fruit drinks	cans	50 (**)	1458	1325	1400		0,000
Other fruit juices		50 (**)	1300	1300	1300		0,039
Mineral/distilled/ Bottled	liters	0	55	300	300		0,111
Angkor Beer	cans	145 (*****)	2500	2500	2500		0,129
Tiger Beer	cans	145 (*****)	1800	2000	1875		0,042
Other Brands of Beer	cans	145 (*****)	2000	1050	400		0,649
Wine	bottles	7500 (*****)	1200	1000	800		10,961
Distilled spirits	bottles	2357 (*****)	1500	1000	800		20,726
Cereals							
Rice (good quality)	kgs	3530 (!)	700	550	600		117,880
Rice (broken quality)	kgs	3530 (!)	650	580	571		313,380
Rice (sticky)	kgs	3530 (!)	857	800	700		4,227
Whole grain maize	100 gms	364 (!)	40	40	35		2,672

Table D.1: (Cont.)

Market prices						
	Unit of measurement	Calorie value per unit	Phnom Penh	Other Urban	Rural	Quantity of 3rd quintile (*1000)
Corn on the cob	number	120 (**)	100	88	67	33,218
Other grains		235 (****)				0,000
Pnum pan	100 gms	240 (**)	300	200	200	7,080
Other bread	100 gms	301.5 (!)	400	300	300	0,637
Wheat	100 gms	332 (*)				0,000
Other flour	100 gms	341 (*)				1,174
Fermented Noodles	rice	203 (*)	80	67	60	92,618
White rice/clear Noodles	100 gms	203 (*)	281	150	160	5,226
Yellow noodles	100 gms	203 (*)	333	300	250	12,641
Other noodles	100 gms	358 (!)	200	200	200	0,000
Biscuits/cookies	100 gms	407 (*)	500	500	500	0,629
Rice cakes	100 gms	235 (*)	200	133	100	28,962
Other traditional cakes	100 gms	300 (*)	200	150	100	7,446
Other cereals	100 gms	285 (***)	200	200	200	0,000
Dairy products						
Condensed milk (sweetened)	100 gms	115 (!)	1400	410	1100	4,250
Powdered milk	100 gms	115 (!)	817	500	800	0,067
Powdered milk (baby)	100 gms	477 (*)	1600	775	450	0,701
Ice cream	100 gms	140 (*)	200	100	200	5,808
Butter	100 gms	729 (*)	2300	2300	2300	0,000
Cheese	100 gms	390 (*)	2250	2250	2250	0,000
Other dairy products	100 gms	412 (***)	500	500	500	0,003

Table D.1: (Cont.)

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Eggs							
Chicken eggs	number	76 (**)	208	217	200		7,969
Duck eggs	number	76 (****)	200	200	200		97,855
Other fresh eggs	number	76 (****)	200	200	200		0,000
Boiled duck eggs	number	76 (****)	300	250	250		1,231
Fermented/salted eggs	number	100 (****)	250	300	300		3,859
Fruit							
Fresh bananas	number	125 (**)	1000	700	500		44,581
Fresh oranges	number	46 (**)	208	167	133		19,885
Fresh pineapple	number	250 (****)	600	400	400		6,981
Fresh coconut milk mango	number	150 (****)	400	333	73		2,793
Other fresh mangoes	number	150 (****)	300	115	100		9,988
Fresh lemon	number	10 (**)	80	80	60		4,676
Lime	number	5 (****)	100	67	50		42,408
Fresh rambutan	100 gms	64 (*)	150	165	150		15,552
Fresh mangosteen	number	20 (****)	500	500	500		0,576
Fresh papayas	number	400 (****)	500	400	200		20,846
Fresh durians	number	450 (****)	6000	6833	4325		0,010
Fresh breadfruits	number	125 (****)	1000	500	467		0,485
Sugar cane		50 (****)	200	200	108		9,743
Apricot	number	33 (**)	300	200	550		0,955
Lotus fruit	number	100 (****)	100	87	50		2,136
Pomelo/grapefruit	100 gms	39 (**)	600	500	400		2,622
Watermelon	number	420 (**)	1000	500	500		11,491
Calamansi	number	100 (****)	167	188	110		0,560

Table D.1: (Cont.)

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Chico	100 gms	100 (****)	120	114	80		9,223
Jackfruit	number	360 (****)	3250	1750	2000		1,049
Grapes	number	4 (*)	500	600	550		0,000
Apples	number	56 (**)	646	700	700		0,000
Blackberry	100 gms	30 (**)					0,000
Other fresh fruits		100 (****)	300	180	92		6,063
Canned pineapple	100 gms	92 (**)	533	533	533		0,000
Canned lychees	100 gms	71 (**)	1900	2000	2000		0,000
Canned fruit salad/fruit cocktail	100 gms	83 (**)	1200	1200	1200		0,586
Dates	100 gms	143 (**)	300	500	450		7,172
Tamarind	100 gms	214 (**)	100	100	100		68,829
Other prepared, dried,	100 gms	260 (****)	50	63	100		11,786
Coconut (young and matured)	number	1336 (***)	600	500	500		8,289
Cashew nuts	100 gms	543 (*)					0,000
Lotus nuts	100 gms	334 (*)	180	200	200		0,386
Peanuts	100 gms	314.2 (!)	200	200	200		9,128
Gourd seeds	100 gms	400 (****)	400	400	400		0,015
Other nuts	100 gms	400 (****)	200	200	200		0,156
Meat							
Pork without fat	100 gms	359.6 (!)	600	500	400		41,052
Pork with fat	100 gms	457 (*)	450	400	400		142,040
Fresh beef	100 gms	273 (*)	500	447	400		36,176
Fresh buffalo meat	100 gms	123.3 (!)	450	450	350		0,954
Fresh chicken	100 gms	302 (*)	500	450	350		77,549
Fresh duck	100 gms	126 (!)	380	342	300		9,742

Table D.1: (Cont.)

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Other fresh meat	100 gms	171.2 (!)	350	349	349		0,816
Mud fish (large)	100 gms	150 (*)	400	350	300		32,943
Mud fish (small)	100 gms	100 (*****)	342	300	250		375,880
Snake fish	100 gms	100 (*****)	300	300	200		4,657
Cat fish	100 gms	91 (*)	350	250	233		114,950
Sea fish (large)	100 gms	100 (*****)	400	300	300		4,244
Sea fish (small)	100 gms	100 (*****)	260	150	200		24,121
Shrimps/prawns	100 gms	90 (!)	1000	700	250		1,092
Crabs	100 gms	100 (*)	475	300	50		63,775
Other fresh sea food	100 gms	100 (*****)	200	200	200		161,850
Imported processed meat	100 gms	325.9 (!)					0,000
Roasted pork	100 gms	249 (*)	1000	800	900		0,234
Roasted/fried chicken	100 gms	229 (*)	1000	850	1000		0,000
Treated beef	100 gms	200 (*)	800	800	800		0,233
Other locally Processed meat	100 gms	325.9 (!)	675	700	500		0,791
Smoked fish	100 gms	145 (*)	455	400	400		26,983
Fermented/cheese fish	100 gms	66 (*)	200	200	150		141,540
Dried fish	100 gms	335 (*)	600	400	350		42,824
Canned fish	100 gms	179 (***)	700	500	400		2,753
Dried prawns/shrimps	100 gms	240.9 (!)	1000	900	500		0,525
Other processed Marine products	100 gms	179 (***)	275	275	275		0,082
Oils and fat							
Rice bran oil	mls	7 (*****)	4	4	4		49,371
Vegetable oil/soybean	mls	7 (*****)	4	3	2		402,470

Table D.1: (Cont.)

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Cooking oil	100 gms	7 (*****)	3	3	3		0,131
Pork fat	100 gms	816 (*)	200	200	200		63,431
Margarine	100 gms	723 (*)	267	200	200		0,114
Other food products							
Fried insects		400 (*****)	300	300	300		0,346
Peanut preparation		585 (*)	200	200	200		0,682
Flavored ice		100 (*****)	200	200	150		3,455
Ice		100 (*****)	250	300	200		23,201
Other food products		100 (*****)	130	130	130		0,584
Meals at work/ school/restaurant	calories	1(***)					45471,500
Snacks, coffee, softdrinks purchased and eaten outside the house	calories	1(***)					12211,200
Prepared meals bought outside and eaten at home	calories	1(***)					0,000
							0,000
Sugar, salt, spices and seasoning							
Granulated(refined) Sugar	100 gms	376.7 (!)	150	140	150		47,010
Brown sugar	100 gms	376.7 (!)	120	100	100		200,100
Juggery	100 gms	350 (*****)	137	150	100		6,127
Chocolate candy bars	100 gms	402.6 (!)	500	500	500		0,245
Hard candy	100 gms	402.6 (!)	400	300	410		1,026

Table D.1: (Cont.)

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Other sugar products	100 gms	493 (****)	100	50	45		2,033
Salt	100 gms	0	40	40	40		165,800
Garlic	100 gms	117 (*)	200	200	200		46,543
Coriander	100 gms	37 (*)	200	200	200		2,616
Ground black and White pepper	100 gms	325 (*)	317	400	300		6,769
Black/white Peppercorns	100 gms	220.5 (***)	375	300	300		3,162
Red pepper spice	100 gms	116 (*)	300	200	200		8,506
Monosodium Glutamate	100 gms	0	500	500	500		41,774
Ginger	100 gms	46 (*)	200	200	200		3,349
Palm vinegar	mls	1.4 (****)	1	1	1		474,550
Soysauce	mls	1.44 (*****)	2	2	2		2170,270
Fish sauce	mls	1.4 (****)	1	1	1		16316,100
Tomato sauce/tomato Catsup	100 gms	83 (*)	350	350	350		0,000
Other spices and seasoning		0	200	200	200		0,000
Vegetables							
Trakun	100 gms	20 (****)	100	100	100		158,970
Onion/leeks	100 gms	48 (*)	200	200	192		9,259
Leaves/shallot							
Cabbage leaves	100 gms	37 (!)	100	80	60		181,450
Lettuce, spinach	100 gms	21 (!)	100	100	60		36,078
Other leafy vegetables	100 gms	20 (****)	150	100	100		40,474
Tomatoes	100 gms	20 (!)	90	100	50		65,820

Table D.1: (Cont.)

	Unit of measurement	Calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Bell peppers	100 gms	30 (****)	160	150	100	2,226	
Ridge gourd	100 gms	17 (*)	100	100	80	82,835	
Bitter gourd	100 gms	19 (*)	120	100	73	13,520	
White/yellow/green Gourd	100 gms	17 (*)	80	80	60	133,090	
Cucumbers	100 gms	12 (*)	80	60	50	179,530	
Squash	100 gms	50 (*)	80	70	60	23,596	
Brinjals/eggplants	100 gms	26 (*)	100	100	50	73,419	
Onion	100 gms	30 (*)	200	200	150	1,713	
Cauliflower	100 gms	29 (*)	150	150	150	5,067	
Radish/white radish	100 gms	26 (*)	155	155	155	0,000	
Turnip	100 gms	21 (*)	50	55	33	4,673	
Carrots	100 gms	37 (*)	200	275	200	0,222	
Other vegetables	100 gms	17.6 (!)	135	100	80	55,873	
Potatoes	100 gms	82 (*)	200	250	40	2,881	
Sweet potatoes	100 gms	108.8 (!)	40	50	30	93,619	
Cassava	100 gms	156 (!)	50	50	30	58,789	
Traov	100 gms	20 (****)	80	110	50	38,192	
Other tubers	100 gms	20 (****)	110	50	80	6,360	
Green gram	100 gms	20 (****)	180	120	140	14,728	
Green dhall	100 gms	20 (****)	180	200	120	2,988	
Cowpea	100 gms	37 (*)	120	152	120	1,458	
Bean sprouts	100 gms	20 (****)	100	80	100	28,983	
Long green beans	100 gms	20 (****)	100	100	75	30,799	
Short green beans	100 gms	20 (****)	130	160	80	0,767	
Other pulses/legumes	100 gms	20 (****)	85	85	85	1,892	
Cucumber pickles	100 gms	14 (*)	200	200	100	11,202	

Table D.1: (Cont.)

	unit of measurement	calorie value per unit	Market prices				Quantity of 3rd quintile (*1000)
			Phnom Penh	Other Urban	Rural		
Other pickles	100 gms	20 (*****)	200	167	100	6,804	
Tomato paste	100 gms	20 (*****)	250	250	250	0,031	
Other prepared and Preserved vegetables	100 gms	20 (*****)	120	129	160	2,590	

Sources for calorie values:

*: FAO

**: Calorietable N. Duinker-Joustra

***: estimate

****: Indonesia table

*****: S.O.W.

(!): Vietnam

ANNEX E

TECHNICAL GUIDE FOR PROGRAMMERS

Introduction

This annex gives a detailed account of how the poverty lines were constructed for Cambodia. The annex is aimed at computer programmers who wish to repeat the analysis. Detailed instruction, including the essential lines in computer programs, are given to guide the reader. It is assumed that the main text, in which the method is explained is familiar to the reader. The annex should be read as a recipe for doing the calculations.

We will start from the data files as they were prepared by the National Institute of Statistics in Cambodia. First, we give a description of how the data files are constructed and which data files are needed to calculate the poverty lines. You can read this in section A2. Paragraph A3 is concerned with how we can create our own dataset from the Dbase files. We will also explain how we construct variables needed for the analysis in paragraph A4 and how the data were cleaned in part A5. Section A6 will tell us something about computing total consumption per person per day and A7 will describe how to compute calorie intake. In part A7 you will find a description on how we constructed the food poverty line.

Description of the Data Files

In this part of the annex we will explain how the datasets are constructed.

The data we received consist of 24 different datasets, all in Dbase format. You can find the names of the datasets and a short description in Table 1 and 2 of Annex B. For doing the price estimates we also relied on original files, not included in the standard package.

All data files are on a household level and contain 5578 observations, which can be identified by the variable HHSN: the household-number. This does not do for the file pufdemo.dbf, because this file is based on an individual level. In this particular dataset, each individual in each household is interviewed. In this way we get 32709 observations, so all these 32709 interviewed individuals belong to one of the 5578 households. In the same

dataset pufdemo.dbf, we can trace to which household the observation belongs to by using the variable HHSN.

There are four datasets, namely pufdemo.dbf, pufhaus.dbf, pufinco.dbf and pufexpdt.dbf, which contain general information about the household, such as demographic characteristics and consumption and income patterns . From these four datasets we will only use the data file pufdemo.dbf, because this is the only file that can tell us something about the number of persons in a household.

The other twenty datasets contain information concerning food and non-food products consumed per household for some specified period. E.g. if we take a look at the dataset x_beverag.dbf we will find that this file contains data on several products with relation to beverages on a weekly basis. In this dataset we can see that for each product i there is a variable representing the quantity consumed in each household per week, $product_i.q$, and there is a variable representing the corresponding amount in Riels paid for that quantity, $product_i.v$. E.g. the quantity of instant coffee consumed, is the variable coffl_q and the amount in Riels paid for that quantity is coffl_v.

There is one exception: the dataset x_otfood.dbf contains the number of Riels per household spent on meals at work, school and restaurant, the amount of Riels spent on snacks, coffee and/or softdrinks purchased and consumed outside the house and the amount of Riels spent on prepared meals bought outside and eaten at home, but does not have the matching quantities for these three products. This is a problem we will solve later. See also paragraph A7.

If we take a look at the Dbase file of beverages we will also find the unit of measurement for each item. For instance: instant coffee has a unit of measurement equal to 100 grams.

Note that the non-food datasets do not have data on the quantities bought of each product; there is only data available on the amount in Riels spent on the specified products, thus the variable $product_i.v$.

Creating an Analysis file from The Dbase Files

Now that we have made an thoroughly analysis of the datasets available we can make the first step by creating a dataset we can use for our analysis. In this part we will explain how we can create our own dataset from the data files provided by the Cambodia Institute of Statistics.

As mentioned above, we will need the file pufdemo.dbf, because we need to count the number of persons in a household. We also want to use all the files containing necessary information about the consumption of various products, food and non-food.

We now arrive at the point where we can use our statistical software to create our dataset, because we now know what variables we need and which datasets for these variables are necessary. So we can merge all these datasets, pufdemo.dbf and the twenty consumption files starting with x_, into one dataset by using the merge variable HHSN. Remember that at this stage we only use the dataset pufdemo.dbf for creating a variable which represents the number of persons in a household.

Creating the Necessary Variables

In section A1 we described the available data, but we also need the prices paid by the households for each food product in order to get a complete overview of the consumption pattern. In this paragraph we will also explain why and how we compute median prices per region for each product properly. After we have computed the correct median prices according to the described procedure in this paragraph, we can use these in the data cleaning process we will discuss in the next section.

Price estimates for pricing the food basket are constructed on the basis of cash expenditures only. Price estimates used for data cleaning are on the basis of total expenditure. As the method for obtaining the median prices is identical, we will explain the construction second price estimates only. We compute median prices because we want to leave out of consideration the outliers of the prices and we compute median prices per region because eventually we will construct poverty lines per region.

We also need median prices of the whole country, because if we decide that we have a median price for one region based on too little observations, we will take the country median price as an estimate of the median price for that region. Also: if we do not have a median price of a certain product for one region (i.e. the median price is equal to zero or is missing for that region), we will also use the country median price as an estimate of the median price for that region.

Now we will explain the procedure of creating prices and median prices per region step-by-step.

- I. First we have to compute the prices for each product i in each food category (with food category we mean the ten categories: beverages, cereals, etc.) according to the following formula:

$$product_i_p = product_i_v / product_i_q,$$

- $product_{i,q}$ = the quantity consumed of product i per household per week,
 $product_{i,v}$ = the amount in Riels spent on product i per household per week.
- II. The next step is to calculate median prices for each product i: $product_{i,m}$, and we will compute this by region: Phnom Penh, other urban regions and the rural regions.
 - III. We also need to compute the median prices for each product for the whole country, $product_{i,1}$.
 - IV. Next we will use the country median price as an estimate of the regional median price if the regional median price is equal to zero or is missing: $product_{i,m} = product_{i,1}$, if $product_{i,m} = 0$ or $product_{i,m}$ = missing, where
 $product_{i,m}$ = median regional price of product i,
 $product_{i,1}$ = country median price of product i.
 - V. Further we will use the country median price as an estimate of the regional median price, if the regional median price is based on too little observation (we use 10 observations): $product_{i,m} = product_{i,1}$, if $product_{i,n} < 10$, where
 $product_{i,m}$ = median regional price of product i,
 $product_{i,1}$ = country median price of product i,
 $product_{i,n}$ = number of observations the median regional price of product i is based on.

The Data Cleaning Process

5. The median prices per region we now have computed, will be used in the data cleaning process which is described in this section. We will use the computed median prices in two different ways.

First: For some observations we have a positive amount of Riels spent on some product, but the corresponding quantity is missing or zero. It can also be the other way around: we know a household uses a positive quantity of some product, but the amount of Riels paid for that quantity is missing or zero. However: we do not want to delete these observations, because if we do we will lose information. In this case we use the median prices per region we have computed. In the case the quantity is missing or zero for some product but the cost of that product is positive, we can estimate the quantity of that product as the division of the positive amount of Riels paid for that product by the median price of that product. We use the same approach if the value is missing or equal to zero and the corresponding quantity for that household is positive. Stepwise:

- VI. $product_{i,q} = product_{i,v} / product_{i,m}$, if ($product_{i,q} = 0$ or $product_{i,q}$ = missing) and ($product_{i,v} > 0$), where
 $product_{i,q}$ = the quantity of product i consumed per household per week,

- $product_i_v$ = amount in Riels spent on product i per household per week.
 $product_i_m$ = median regional price of product i.
- VII. $product_i_v = product_i_q * product_i_m$, if ($product_i_v = 0$ or $product_i_v$ = missing) and ($product_i_q > 0$),
where
 $product_i_q$ = the quantity of product i consumed per household per week,
 $product_i_v$ = amount in Riels spent on product i per household per week.
 $product_i_m$ = median regional price of product i.

Second: We also face another problem. If the price of a product divided by the median price of that product is larger than or smaller than one fifth and if the quantity of that product lies outside the 95% confidence interval, the quantity is an outlier. The fact that the price divided by the median price for that product is larger than 5 or smaller than one fifth and the fact that the quantity lies outside the 95% confidence interval, means that only the quantity of that product is an outlier and the corresponding amount in Riels paid for this product is not. We now use the median price for the second time to repair this sort of outliers by defining the quantity equal to the amount in Riels paid for that quantity divided by the median price. We can use the same approach in the case the amount paid in Riels for a product lies outside the 95% confidence interval and the price divided by the median price for that product is larger than 5 or smaller than one fifth. Use the following steps:

- VIII. Compute the mean $product_i_{aq}$ and standard deviation $product_i_{sq}$ of the quantity, $product_i_q$, of product i consumed per household per week,
- IX. Check the condition:
 $|product_i_{aq} - product_i_q| > product_i_{sq} * 1.96$
and
 $(product_i_p / product_i_m > 5 \text{ or } product_i_p / product_i_m < 0.2)$.
If this condition is true then: $product_i_q = product_i_v / product_i_m$,
- X. Compute the mean $product_i_{av}$ and standard deviation $product_i_{sv}$ of the amount, $product_i_v$, in Riels paid for product i per household per week,
- XI. Check the condition:
 $|product_i_{av} - product_i_v| > product_i_{sv} * 1.96$ and
 $(product_i_p / product_i_m > 5 \text{ or } product_i_p / product_i_m < 0.2)$.
If this condition is true then: $product_i_v = product_i_q * product_i_m$.

Computing Total Consumption per Person per Day

In this paragraph we describe how food consumption, non-food consumption and total consumption per person per day can correctly be computed by using our own dataset.

We have already seen in paragraph A2 that we have a data file, called pufexpdt.dbf, which contains information about the monthly consumption of each household for several

food and non-food categories. This dataset also contains information about total consumption. But now that we have our own clean version of the data, abstracted from the twenty datasets containing information about the consumption of individual products, we will use this cleaned dataset to compute these totals again. We do it this way because we will also do our other analysis on this dataset and we want all to be based on the same dataset.

When we compute food consumption, non-food consumption and total consumption, we first have to compute consumption per category. We have twenty different categories, because this time we will also look at the non-food categories; we also want to know non-food consumption and total consumption.

First we take a look at the ten food categories and we see that each category is on a weekly basis per household. So to get a correct figure of total food consumption, we first compute the sum of the amounts spent in Riels per household per week for each food category. Then we compute total food consumption as the aggregate of the ten totals of these categories. This aggregate is still the total food consumption per household per week, so to get total food consumption per person per day we have to divide this total by the number of persons in the household and we have to divide this by seven, i.e. the number of days in one week. Step-by-step:

- XII. Compute the sum of the amounts spent in Riels per household per week for each of the ten food categories: beverages, cereals, dairy products, eggs, fruits, meat, oils and fat, other food products, vegetables and sugar, salt, spices and seasonings. E.g. we compute the weekly consumption of beverages for each household as: $S_i \text{product}_i \text{v}$, where we sum over all products i in the category beverages,
- XIII. Compute the sum of these ten totals. This is total food consumption per household per week,
- XIV. Compute total food consumption per person per day by dividing total food consumption per week by the number of persons in the household and by 7.

We want to do the calculations on the non-food categories on a monthly basis, because this is the period that appears mostly. Because not all the data in the non-food categories are based on weeks or months only. If we take a look at e.g. the household expenditures on personal care and effects, i.e. the data file `x_pers.dbf`, we see that some products cover a month and others cover a whole year! So when adding up the expenditures in one category we have to be aware of the fact that we first have to convert all annual and 6 monthly periods to one month and then adding the products in one category to get monthly expenditures. After we have done this for all ten non-food categories we can compute the sum of the total non-food consumption by aggregating these ten totals. Stepwise:

- XV. Compute the sum of the amounts spent in Riels per household for each of the ten non-food categories: clothes, education, furniture, housing, medicines, miscellaneous items, tobacco, recreation, personal care and transportation. E.g. if we want to compute the total consumption per household per month in the category transportation we do: $S_{i1}product_{i1_v} + (S_{i2}product_{i2_v})/12$, where we sum over all products i1, which refer to a monthly period, such as gasoline and tubes. Then we sum over all products i2 which refer to an annual period, such as a car and a bicycle. These amount have to be divided by twelve to get expenditures per month.
- XVI. Compute the sum of these ten totals to get total non-food consumption per household per month.
- XVII. Compute total non-food consumption per person per day by dividing total non-food consumption per month by the number of persons in the household and by 30. After we have computed the correct amounts spent on total food consumption per person per day and total non-food consumption per person per day we can compute total consumption, by adding total food and non-food consumption:
- XVIII. To get total consumption per person per day: add total food consumption per person per day and total non-food consumption per person per day.

Computing Total Calorie Intake per Person per Day

In this paragraph we will describe how we can compute the total number of calories a person consumes per day. But first we make some comments on the unit of measurement used for the quantities given in the dataset.

In the original datasets the households are asked what the quantity of each product is they use per week. These quantities are measured in the same unit of measurement for each observation. We have used these to determine the corresponding calorie value. E.g.: the households are asked how much rice they consume per week in kilograms. So we need the calorie value of rice per kilogram. Thus if we take into account the correct measures for each product, we can compute how high the calorie intake of each product per person per day is by multiplying the quantity and the corresponding calorie value divided by the number of persons in the household and divided by seven (number of days per week).

We can indeed do this for all food items, but not for some products in the category other food products. That is because we do not have the quantity consumed of three products in this category, only the amounts in Riels spent on those products per household per week. These three products are:

(a) meals consumed at work, school and restaurant, (b) prepared meals bought outside the house and eaten at home, and (c) snacks, coffee and softdrinks purchased and eaten outside the house. But we also want to use the calorie intake of these three products, when computing the total amount of calories consumed.

We can solve this problem as follows: compute the total amount in Riels of food eaten per person per day, minus the amount in Riels of the three products mentioned above. Compute also the total number of calories consumed per person per day (of course without the three product, because we do not have the correct calorie values yet). We now compute a ratio equal to the computed total amount spent on food per person per day divided by the computed number of calories per person per day. This ratio acts as prices per calorie. We can use this ratio to compute the median prices of the three products, per calorie and per region. We assume that the three particular products cost twice as much than when prepared at home (so one calorie cost twice as much outside the house) so now we can compute the number of calories for those three products. After we have these calorie values, we can now finally add all calorie values together to get the total calorie intake per person per day.

We can say that for the three specific products the quantities are measured in calories. This means that we now have a value for the quantity of these products: namely the number of calories. In this case we can set the calorie value of these three products equal to one, because we already have assumed that the quantities are measured in calories. If we do this step-by-step we get:

- XIX. Compute the number of calories per product i per day by using the formula:

$$\text{product}_{i_k} = \text{product}_{i_q} * \text{product}_{i_c} / (\text{members} * 7),$$
 where
 product_{i_k} = calorie intake of product i per person per day,
 product_{i_q} = quantity of product i consumed per household per week,
 product_{i_c} = number of calories in product i ,
 members = number of persons in the household.
- XX. Compute the total number of calories per person per day, for all food items, except for the three above mentioned products in the category other food products:

$$\text{xtotacpp} = \sum_{i,x} \text{product}_{i,x_k}$$
, where we sum over all products i and all categories x , except for the three food items we mentioned above (because we do not have these data), xtotacpp = the total number of calories per person per day minus the three food products, $\text{product}_{i,x_k}$ = calorie intake per person per day of product i of category x ,
- XXI. Compute tvalmeal = the total consumption of food per person per day minus the amount in Riels for the three products,
- XXII. Compute: $\text{ratio} = \text{tvalmeal} / \text{xtotacpp}$ if $\text{xtotacpp} > 0$,
- XXIII. Compute the median prices per calorie by region for the three products as the median of the ratio: $\text{mratio} = \text{median}(\text{ratio})$ by region,
- XXIV. We now can compute the number of calories in each of the three products according to the formula: $\text{product}_{i_c} = \text{product}_{i_v} / (\text{members} * 7 * \text{mratio} * 2)$,
 where

$product_i_c$ = number of calories in one of the three products i,

$product_i_v$ = amount spent on product i per household per week,

mratio = the median price by region per calorie, and we divide by two because we have assumed that one calorie costs twice as much outside the house.

XXV. With these new calorie values computed for the three products, we can add up all consumed calories per person per day to get the total number of calories consumed per person per day: $tota_cpp = xtacpp + \sum_{i=1,2,3} product_i_c$, where we sum over the three products.

XXVI. For the three products we can define $product_i_q = product_i_c$,
where

$product_i_q$ = quantity of product i consumed per household per week measured in calories, $product_i_c$ = number of calories in product i.

XXVII. For the three products we can define $product_i_c = 1$, because the quantities are measured in calories, so we can set the corresponding 'calorie' variable equal to one.

We now have all the information available to compute a correct poverty line. This is described in the final section.

The Food Poverty Line

We have arrived at the point at which we have all information available to do the final intensive data step: computing the food poverty line.

First we need a correct weight variable for doing this analysis. We will use the variable weight, which we can find in all the datasets. Now we want to select a group on which we want to base our poverty line, e.g. all observations in the third quintile of total consumption per person per day, which we have computed in section A5, and by using the variable weight mentioned above. This will be our reference group.

The next step will be to compute the means of the quantities for each product per person per day of this reference group. With these mean quantities we compute the total number of calories per person per day in this reference group. We will assume that the recommended food energy intake in calories per day for Cambodia is equal to 2100 per day. We can now calculate alpha as: 2100 divided by the average food energy intake of the reference group, we just have computed. Next we can construct a food poverty line per region by calculating: the median market price per region of product i times the mean quantity of the reference group of that product per person per day times alpha, and this summed over all products. Step-by-step:

XXVIII. Use the variable weight and get all the observations in the third quintile of total consumption per person per day. These observations are our reference group.

- XXIX. Compute: $product_i_g = \text{mean}[product_i_q / (\text{members} * 7)]$, for the reference group created in step one,
- XXX. Compute the average food energy intake of the reference group per person per day:
 $xcalo = S_i(product_i_g * product_i_c)$, (remark: you must also sum over the three products in the category 'other food products'!),
- XXXI. Set alpha = missing and compute alpha = $2100 / xcalo$ if $xcalo > 0$,
- XXXII. Construct the food-poverty line per region:
 $\alpha * S_i(product_i_m * product_i_g)$,
where
 $product_i_m$ = the median regional market price of product i (estimate based on cash purchases only);
 $product_i_g$ = the average quantity consumed of item i by the reference household;
 $\alpha = 2100 / xcalo$ (see also step 4).

Data files

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pufdemo.dbf	Demographic Characteristics	N.A.	32079	HHSN and LINENO
pufhaus.dbf	Housing characteristics	N.A.	5578	HHSN
pufinco.dbf	Households income sources	N.A.	5578	HHSN
pufexpdt.dbf	Household expenditures by major item grouping	Monthly	5578	HHSN

Data Files (Cont.)

Dataset	Description: Household expenditures on: ... by expenditures items	Period	No. of data records	Unique Record ID
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x_cereal.dbf	Cereals	Weekly	5578	HHSN
x_dairy.dbf	Dairy Products	Weekly	5578	HHSN
x_eggs.dbf	Eggs	Weekly	5578	HHSN
x_fruit.dbf	Fruits	Weekly	5578	HHSN
x_meat.dbf	Meat, poultry & fish	Weekly	5578	HHSN
x_oilfat	Oils and fat	Weekly	5578	HHSN
x_otfood.dbf	Other food products and Food consumed away from home	Weekly	5578	HHSN
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x_cloth.dbf	Clothing and Footwear	Six months	5578	HHSN
x_educ.dbf	Education	Monthly	5578	HHSN
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