# カンボディア
# 中等理数科教員養成・訓練計画
# 事前調査団報告書
# (資料編)

平成11年5月



国際協力事業団
社会開発協力部

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# 1. General Population Census of Cambodia 1998

KINGDOM OF CAMBODIA
Nation - Religion - King

National Institute of Statistics, Ministry of Planning
Phnom Penh, Cambodia

Funded by:
United Nations Population Fund

July, 1998

KINGDOM OF CAMBODIA
Nation - Religion - King

# General Population Census of Cambodia 1998

## Provisional Population Totals

National Institute of Statistics, Ministry of Planning
Phnom Penh, Cambodia

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# PROVISIONAL POPULATION TOTALS

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# FOREWORD

Cambodia's first population census in 36 years was conducted in March 1998. We have great pleasure in presenting this report containing the preliminary results of this census. These results are based on careful scrutiny and tabulation of summary figures prepared by enumerators. They give the population of Cambodia and provinces by sex and rural-urban classification. At present, data processing of filled-in census questionnaires of more than two million households is in progress. When it is completed, the final census data in the form of a variety of statistical tables will be available. This is expected to be ready by the middle of next year. In the meanwhile, these preliminary figures are published to give a general idea of the size and distribution of the population of Cambodia.

We express our deep sense of gratitude to HE Chairman of the National Assembly (Acting Head of State), HE Deputy Chairman of National Assembly, HE First and Second Prime Ministers, HE Deputy Prime Minister and Co-Minister of Interior and HE Minister of Planning for their messages to the nation on the eve of the 1998 census which went a long way in enlisting the co-operation of the people and the enumeration staff. Our thanks are due to the members of the National Census Committee, Technical Committee for the Census and the National Steering Committee for Census Information and Education Campaign for their guidance from time to time.

We have always depended heavily upon the support and encouragement of HE Sar Kheng, Deputy Prime Minister and Co-Minister, Ministry of Interior and Chairman of the National Census Committee and HE Chea Chanto, former Minister of Planning and Chairman of the Technical Committee for the Census and National Steering Committee for Census Information and Education Campaign, but for whose active interest at every stage of the census operations, it would not have been possible to put through this gigantic task.

The census operations were carried out mostly with the help of the Province Census Committees headed by Governors of Provinces. We thank the Governors and the members of the Provincial Census Committees for their assistance. The Press, the radio and the TV played a very important role in census publicity and our thanks are due to them.

We wish to place on record our gratitude to the United Nations Population Fund (UNFPA) and in particular its successive Representatives in Cambodia, Dr. Vincent Fauveau and Mr. Hedi Jemai for providing the necessary funding and technical assistance. We also thank the staff of UNFPA office Cambodia for their continued assistance. We are grateful to the United Nations Department for Economic and Social Affairs (DESA) for their co-operation in executing the project.

We thank the UNDP, especially Mr. Paul Mathews, Resident Representative for providing funds for census vehicles and computer equipment. Our thanks are due to UNESCO, its former Director Mr. Bruno Lefevre and Ms. Sophie Borel, Campaign Co-ordinator and her colleagues for successfully implementing the advocacy and public information campaign for the census.

We thank the international team of observers consisting of Mr. Sam Suharto, Chief, Demographic and Social Statistics Branch, UN Statistical Division, New York, Mr. Pali Lehohla, Chief Director, Demography, Central Statistical Services, South Africa and Mr. Jerrold W. Huguet, Population Affairs Officer, Population Division, ESCAP.

Our thanks are due to Mr. Nott Rama Rao, Chief Technical Adviser, Mr. Harry Lode, Data Processing Adviser and other staff of the Census Project for their constant assistance and guidance. We thank all the UN Volunteers associated with the census for their dedicated work.

The success of the census operations is mainly due to the teamwork in the census organisation itself. The Census of Cambodia is a massive administrative-cum-statistical exercise and its completion has been possible with the total help and co-operation received from one and all. The major share of the credit for the success of the census should go to the people of Cambodia themselves and to the large number of devoted, hard working and loyal enumerators, supervisors, village chiefs, commune, district and province census officers and their colleagues, Regional and Assistant Regional Officers and other staff of NIS and Ministry of Planning drafted for census work.

Mr. Hou Taing Eng, Director, NIS ably co-ordinated the census operations. It is continued efficiently by Mr. San Sy Than, Director, NIS assisted by Mr. Seng Soeun, Deputy Director, NIS, in post-census activities. Thanks are due to each of them.

It is hoped that Ministries, international agencies, researchers and the public will find this report useful.

Suy Sem
Acting Minister of Planning

Ministry of Planning
Phnom Penh
July 27, 1998

## Composition of the National Committee for the General Population Census of Cambodia

| | | |
|---|---|---|
| 1. | HE Deputy Prime Minister and Co-Minister of the Ministry of Interior | Chairman |
| 2. | HE Minister of Planning | Vice Chairman |
| 3. | HE Under Secretary of Council of Ministers | Member |
| 4. | HE Under Secretary of Ministry of Defence | Member |
| 5. | HE Under Secretary of Ministry of Planning | Member |
| 6. | HE Under Secretary of Ministry of Economy and Finance | Member |
| 7. | HE Under Secretary of Ministry of Education, Youth and Sports | Member |
| 8. | HE Under Secretary of Ministry of Health | Member |
| 9. | HE Under Secretary of Ministry of Information | Member |
| 10. | HE Under Secretary of Women Affairs | Member |
| 11. | Director of National Institute of Statistics of Ministry of Planning | Secretary |

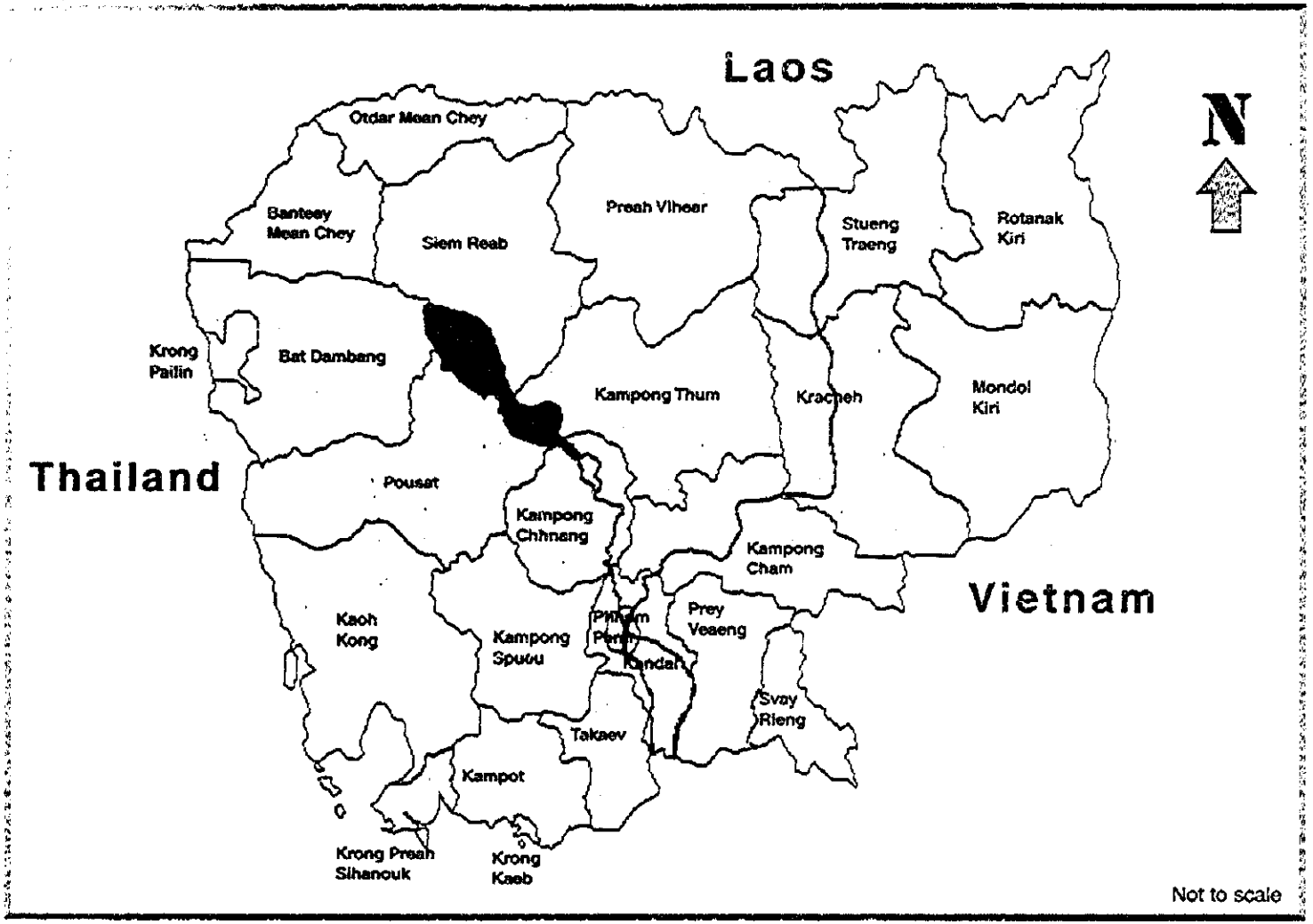
## Composition of the Technical Committee for the General Population Census of Cambodia

| | | |
|---|---|---|
| 1. | HE Minister of Planning | Chairman |
| 2. | HE Under Secretary of Ministry of Planning | Vice Chairman |
| 3. | Director of National Institute of Statistics of Ministry of Planning | Permanent Member |
| 4. | Chief of Cabinet of Ministry of Planning | Member |
| 5. | Deputy Director General of Ministry of Interior | Member |
| 6. | Director of Geographic Department of Council of Ministers | Member |
| 7. | Deputy Director, Department of Population Statistics of National Institute of Statistics | Secretary |

## Composition of the National Steering Committee for Census Information Campaign

| | | |
|---|---|---|
| 1. | HE Minister of Planning | Chairman |
| 2. | HE Under Secretary of Ministry of Planning | Vice Chairman |
| 3. | HE Under Secretary of Ministry of Information | Vice Chairman |
| 4. | HE General Director of Radio and TV | Vice Chairman |
| 5. | Director of National Institute of Statistics | Permanent Member |
| 6. | Representative of Ministry of Interior | Member |
| 7. | HE President of League of Cambodian Journalists | Member |
| 8. | Representative of Khmer Press Agency | Member |
| 9. | Representative of Ministry of Education, Youth and Sports | Member |
| 10. | Representative of Ministry of Health | Member |
| 11. | Representative of Ministry of Cults and Religion | Member |
| 12. | Representative of Ministry of Culture | Member |
| 13. | Vice Director of National Institute of Statistics | Secretary |

# Map 1. Cambodia - Provinces

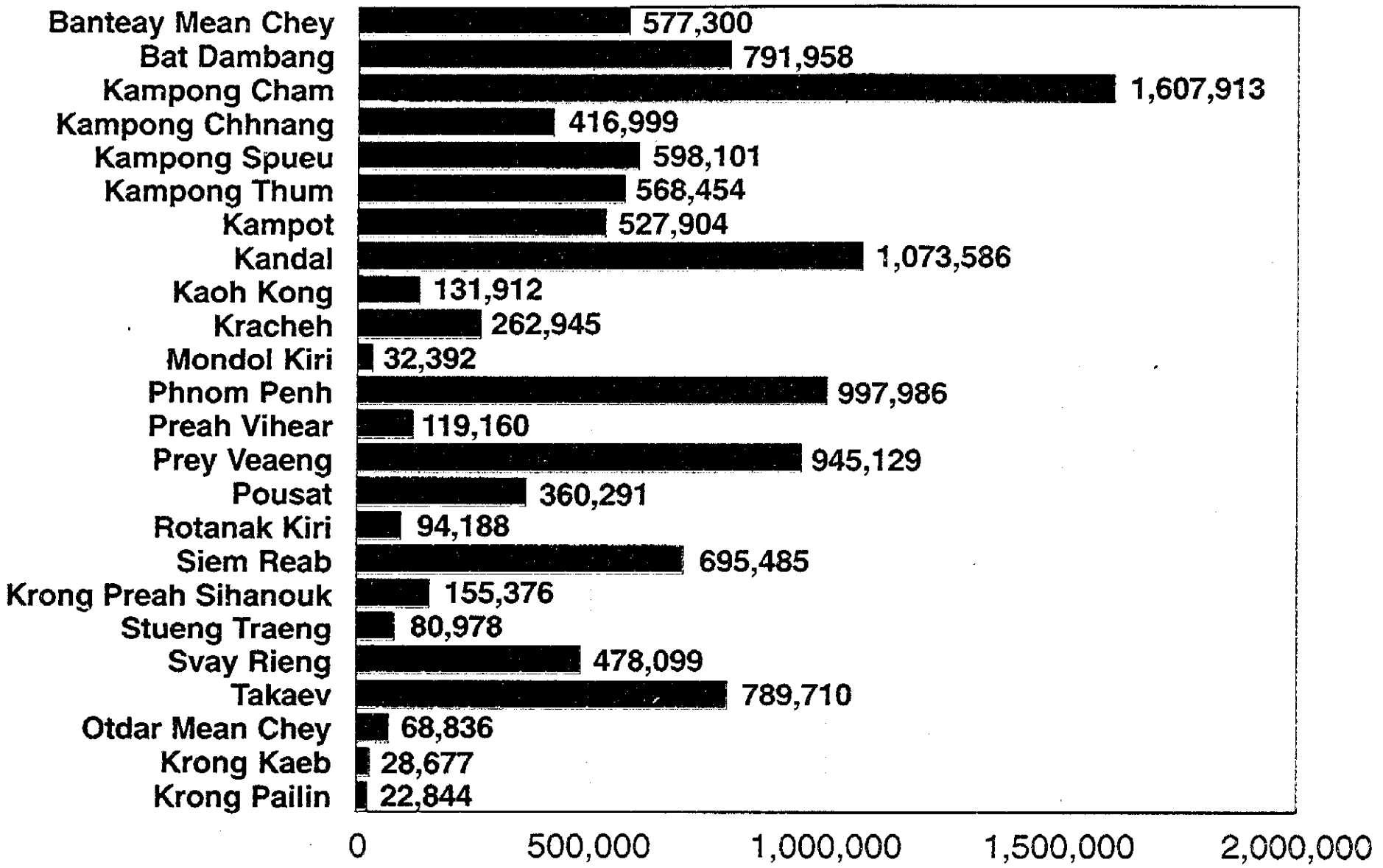


# Provisional Population Totals

## Figures at a Glance

| | | |
|---|---|---|
| Number of Provinces | | 24 |
| Number of Districts | | 182 |
| Number of Communes | | 1,623 |
| Number of Villages | | 13,408 |
| Population of Cambodia | Both Sexes | 11,426,223 |
| | Males | 5,509,204 |
| | Females | 5,917,019 |
| Percentage of Urban Population | | 15.7 |
| Annual Population Growth Rate (percent) | | 2.4 |
| Density of Population | | 64 |
| Sex Ratio (males per 100 females) | | 93.1 |
| Average Size of Household | | 5.2 |

## Figure 1. Population by Province



# Chapter 1

## Introductory Note

### 1.1 General

This report contains the preliminary results of the General Population Census of Cambodia, 1998. The last official census was conducted in 1962 when the population was counted as 5.7 million. The war and the ensuing upheaval of people since that census has changed the demographic scene of the country completely. For obvious reasons there was no census or systematic surveys during that period. Consequently, there exists currently a very limited population database which is not enough for evolving development policies and programs. This was the background in which a comprehensive population census of Cambodia was considered necessary.

### 1.2 The Census Programme

At the request of the Royal Government of Cambodia in 1993, UNFPA has been providing technical and financial support for conducting a population census from 1995. The first Phase of the Census Project was provided for by UNFPA-funded project CMB/94/P02-Support to National Population Census of Cambodia (Phase I). Under this project (1995-96), a team of technical staff commenced the census preliminary work in 1995. A census office was established and equipped within the National Institute of Statistics (NIS) of the Ministry of Planning, a number of NIS staff and provincial staff were trained in demographic statistics, census and data processing internally and at reputed institutions abroad. This was very necessary as NIS had no staff with census experience. The conduct of national-level Demographic Survey of Cambodia (DSC) covering 20,000 households in March 1996 as part of Phase I activities helped in training staff of the NIS and the provincial and district level statistical system, to carry out successfully a large-scale data collection exercise. The DSC data which were disseminated through reports and diskettes in December 1996 were welcomed and appreciated by the Royal Government of Cambodia as well as data users. Phase II of the UNFPA funded census project (1997-99) CMB/97/P02 focused on capacity building in the preparation for the census, the conduct of the Population Census in March 1998 and data processing and dissemination of results. For Phases I and II of the project the budget is US$1.4 million and 4.9 million respectively. UNDP shared US$0.7 million in Phase II to provide census vehicles and some equipment. The Royal Government of Cambodia also contributed towards census field work expenditure.

The 1998 Census was conducted under the authority of the Royal Decree (Kret) No. JS/RKT/02-96/08 dated February 29, 1996 on the organization of the General Population Census of Cambodia. According to this Decree, the Ministry of Planning is responsible for the General Population Census with the National Institute of Statistics (NIS) as the implementing agency.

By sub-decree No. 12 of January 31, 1997, a National Committee for the General Population Census has been constituted with HE Deputy Prime Minister and Co-

Minister of Interior as Chairman. Technical Committee for the census to go into technical aspects of the census was constituted with the approval of the National Committee. Provincial Census Committees were formed with the respective Governor as chairman to guide and supervise the census work in each province.

For the 1998 Census of Cambodia the reference time was midnight of March 3, 1998 (00 hour of March 3, 1998) which was also referred to as Census Night. The Royal Decree ensured confidentiality of personal information collected in the census. This information would be used for statistical purposes only. After tabulation, the data collected would be used for national and local development.

All persons present in Cambodia (including foreigners but excluding foreign diplomatic corps and the like) on the Census Night were expected to give the required information in the census. There were two schedules used in the census for data collection by enumerators after visiting each household. Form A (Houselist) was for listing buildings and households. Form B (Household Questionnaire) was the main census questionnaire which was canvassed by enumerators in Khmer language.

### 1.3 Field work

One of the most important preliminary items of work for the census was to develop maps at various administrative levels. For the purpose of enumeration each enumerator was given an enumeration area (EA) with definite boundaries. An EA had about 100 households. It might be a village or part of a village (in the case of a big village). Starting from December 1996 the work of preparation of village sketch maps and delineating Enumeration Areas was completed in about a year's time.

The population census was a huge task which involved visiting some two million households in the country located in different terrains, in the course of ten days' time. Apart from families living in houses, those living in institutions like hotels, hostels, pagodas, hospitals, prisons etc, were also enumerated. Special arrangements were made to enumerate the homeless population, transient population and those living in boats, on the night of March 3, 1998.

About 25,000 enumerators and 8,350 supervisors were appointed to do the enumeration of every individual in each and every household. They were spread over 13,400 villages in 24 provinces. This excluded some areas which were inaccessible due to military operations. The population in these excluded areas may be only about 45,000. There were also some difficult areas in the country which were not approachable by road or motor transport. They were reached by enumerators only by walk or by such transport like ox-drawn carts, boats etc. Moreover, enumerators had to be careful about areas which were mined. Being local people, the enumerators were familiar with such danger zones.

The enumerators and supervisors were drawn from teachers and other officials. The staff of NIS, Provincial, District and Commune Offices were used for training the enumeration staff and supervising their work. Services of officers of other ministries and departments were also requisitioned. The latter half of 1997 was mainly devoted to training the trainers of enumerators and supervisors. The enumerators and supervisors were trained during February 1998. The training programme was very crucial for

conducting the census satisfactorily and hence this was carefully planned in 982 training sessions held in 538 training centres all over the country.

The census was supervised by national and international staff. UN Volunteers were posted in six provinces most of them remote. An international team of observers inspected the census. The team reported that census was conducted well.

## 1.4 Census Publicity Campaign

For successfully conducting the census, people had to be informed well in advance about the scope and purposes of the census to get their co-operation. They had to be convinced that the information collected in census would be kept confidential. For this purpose a complementary project called "Advocacy and Public Information Campaign for the Population Census" CMB/97/P08 was executed by UNESCO with UNFPA funding of about 0.5 million US dollars. This project assisted in mobilising all the relevant communication networks in Cambodia:
Physical networks, such as those of the main line ministries, of the cults (mainly the pagoda), the electronic networks, especially radio and television and the press, and also the more traditional communal, district level and provincial campaign networks and their more traditional methods of communications such as banners, stickers, etc.

It also assisted in mobilising all the key personalities of the country, including the Members of Parliament, to support the campaign; training the press, the journalists, the editors and the information officers of the ministries on all issues relative to the census; co-operating with Cambodian institutions and staff for the production of all the printed materials for the campaign.

All the radio/television spots and programmes produced during the campaign were done by or in co-production with the existing Cambodia stations.

## 1.5 Census Questionnaires

Based on the Demographic Survey and census pre-test experience, two questionnaires were prepared for the 1998 Census of Cambodia. These were called: Form A: Houselist and Form B: Household Questionnaire. These questionnaires were discussed in a Data User's Meeting and later approved by the Technical and National Committees. Form A: Houselist which was canvassed during the preliminary round (February 27 to March 2, 1998) was used to collect the following information in respect of buildings which had households in them: Building / Structure number, predominant construction material of wall, roof and floor of building, whether building is wholly or partly residential, household number, and name and sex of head of household and number of persons usually living in the household.

Form B: Household Questionnaire had four parts:- Parts 1, 2, 3, and 4. This was used for census enumeration during March 3 to 12, 1998 in all households. In Part 1, information on usual members of household present on Census Night (March 3, 1998), visitors present on the Census Night and usual members absent on the Census Night was collected.

Part 2 of Form B, was used to collect the following information in respect of each usual member of household present and each visitor to household: Full name, relationship to head of household, sex, age, marital status, mother tongue, religion, birth place, previous residence, duration of stay, reason for migration, literacy, full time education and economic characteristics.

In Part 3 of Form B, fertility information of females aged 15 and over in the household was collected. In Part 4 of Form B, following information was collected on housing conditions and facilities: basis of occupation of the dwelling by household (like owner occupied or rented), main source of light available for the household, main cooking fuel used by household, whether toilet facility was available within premises, main source of drinking water supply for the household and number of rooms occupied by household. Specimen copies of the questionnaires are given at the end.

## 1.6 Census Evaluation

Soon after the census, a Post-Enumeration Survey (PES) was conducted to evaluate the census results. It was conducted in 99 selected EA's. The main objective of the PES was to estimate the coverage and content errors in the census. The collected information is being tabulated and analysed at present.

## 1.7 Data Processing

The main post-census activity of the Data Processing Division is the manual coding and editing of census documents, data entry from the questionnaires, computer editing and tabulation and the generation of various dissemination products.

The manual coding and editing of the census documents are being done in two stages. First, the summary statements were scrutinised and edited. This provided the basis for the provisional census results (population by sex at national and provincial levels), which are released through this book. The second stage will concentrate on the coding and editing of the main census questionnaire (Form B). The activity will require about a year to complete.

Computer editing will help in removing errors and inconsistencies in the data set. The computerised individual census data will be used to generate a number of statistical tables. For this purpose, a Tabulation Plan has been prepared taking into account the user needs. The production of sub-national tabulations can commence by November 1998. This will provide a standard format of Provincial, District and Commune level tabulations which form the input for the initial analysis of the census results. The final census tabulation is expected to be completed by July 1999.

## 1.8 Analysis and Dissemination

The main objective of the census is that its results should be properly analysed and used for planning for development. Census data will be disseminated through publications and the electronic media (diskettes/CD-ROM). Training in data analysis will be given to national staff, in training workshops. Data Analysis will be made by such national staff under the guidance of a consultant. The NIS staff who were trained in demographic statistics and analysis under the census project will be involved in the

census data analysis programme. Analytical reports, each dealing with a specific topic, will be published after the analysis. The 1998 General Population Census of Cambodia will fill in a long felt gap in demographic data in Cambodia. The plethora of census data could be used by the various Ministries of the Royal Government of Cambodia and by UN Agencies, NGOs and professional organisations working in Cambodia. The Census will provide bench-mark data which could be used by the agencies working in different areas like reproductive health and family planning services, education and training, research, population and development, women and gender. The census will also provide a reliable sampling frame which can be used for planning sample surveys and studies in the future. The Government will be able to develop an integrated population information system which in the long run, will be instrumental in monitoring population programmes.

# Chapter 2

## Brief Analysis

### 2.1 General

As the process of editing and coding of more than two million questionnaires and data entry and tabulation will take sometime, provisional population figures have been compiled first and presented as the first results of the 1998 Census of Cambodia. The provisional population results for Cambodia and 24 provinces have been generated by aggregating the figures compiled by enumerators at Enumeration Area level in Form 2 Enumerator's Summary (specimen given at the end) in the course of their field work. Each Enumerator's Summary was initially checked at the census office, NIS by the editing staff with reference to the corresponding Form B Household Questionnaire to ensure that population figures given in the summary tally with those in the filled-in questionnaires. After this initial scrutiny, the summary figures were entered on the computer by the data entry staff. Provisional Table 1 entitled "Number of Households and Population by Province and Sex" presented in this book contains the provisional preliminary results of the 1998 census. Provisional Tables 1.1 and 1.2 relate separately to urban and rural areas. The data available in these tables are discussed in this analytical note.

### 2.2 Size, Growth and Distribution of Population

The Population of Cambodia as at the midnight of March 3, 1998 was 11.43 million consisting of 5.51 million males and 5.92 million females. Out of the world population of 5.93 billion, little over 8.5 percent live in Southeast Asia (506 million). Population of Cambodia forms 2.3 percent of the Southeast Asian population. In terms of population, it occupies the seventh position among the ten countries in Southeast Asia.

According to the 1962 census, the population of Cambodia was 5,728,771 as at census night of April 17-18, 1962. There have been no further censuses and there was no systematic national surveys until 1993 and 1994. Several demographic disasters and shocks took place consequent on Indochina war in the late 1960's, a civil war between 1970 and 1975, the Khmer Rouge rule from 1975 to early 1979, and famine in 1979 and 1980.

Population changes during the 1970s have been examined in detail by several scholars who had made several population estimates. In 1980, the newly established Government of the People's Republic of Kampuchea carried out a population count in 1980. Though described as a General Demographic Survey, it was at best an administrative count. The official total was put at 6,589,954 as at the end of 1980.

Until after 1992, there was little further information about Cambodian population. The number of voters aged 20 and over who were registered by United Nations Transitional Authority in Cambodia (UNTAC) was 4.28 million. The extrapolated population estimated by the Socio-Economic Survey of Cambodia conducted by NIS was 9,870 thousand with reference to April 1994. The NIS carried out the DSC with March 20, 1996 as reference date and covered 20,000 households, as already mentioned.

The results of DSC were extrapolated to give the population of the entire country excluding some areas not covered by the survey for security reasons. The population of Cambodia according to DSC was 10,702,329. The DSC remained the only source of population data until the 1998 census held in March 1998.

Statement 1 presents for easy reference, the population of Cambodia as ascertained at different points of time by different sources.

**Statement 1**
**Population of Cambodia according to different sources**

| Source | Population | | | Remarks |
|---|---|---|---|---|
| | Both Sexes | Males | Females | |
| 1962 census | 5,728,771 | 2,862,939 | 2,865,832 | Reference time of census night on April 17-18, 1962 |
| 1980 General Demographic Survey | 6,589,954 | 3,049,450 | 3,540,504 | With reference to the end of 1980 |
| 1993-94 Socio-Economic Survey of Cambodia | 9,870,000 | 4,714,000 | 5,156,000 | Extrapolated population with reference to April 1994 based on a sample of 5,578 households |
| 1996 Demographic Survey of Cambodia | 10,702,329 | 5,119,587 | 5,582,742 | Extrapolated population with reference to March 20, 1996 based on a sample of 20,000 households |
| 1998 Census | 11,426,223 | 5,509,204 | 5,917,019 | With reference to March 3, 1998. Does not include a few areas where conflict took place at the time of the census. Population in these omitted areas is estimated as 45,000 |

Generally if two censuses are conducted consecutively in a country, say at an interval of 10 years, the inter-censal growth rate of population is worked-out using the two census figures. In the case of Cambodia, there has been no census since 1962. The annual growth rate of population (percent) between the two censuses 1962 and 1998 which are divided apart by nearly 36 years, is 1.9. But this figure has little meaning as the long interval was marked by drastic demographic changes due to war and unrest.

An attempt is, therefore, made to work out the annual growth rate using the results of the DSC, 1996 and the provisional 1998 census results.

The extrapolated population of Cambodia based on DSC was 10,702,329 as on March 20, 1996. The provisional population of Cambodia according to the 1998 Census was 11,426,223. These two figures are not *prima facie* comparable since DSC was a survey of persons in regular and normal households, whereas in the census, all persons were covered including persons living in institutional households, homeless population, boat population and transient population. Thus, those who were covered in the census and not in DSC were persons in military camps (barracks), some police posts, forestry camps, construction sites and such institutions as prisons, dormitories or boarding houses, those living on streets without a home, persons living in moving boats and those who were transient population at the time of the census. In addition, although they should have been covered by the sample design, some squatter settlements and unauthorized residential areas may have been excluded from DSC. On the other hand, the extrapolated population of DSC covered all areas in the country and the census could not cover the following areas due to conflict:- (i) whole districts of Anlong Veaeng in Otdar Mean Chey province, Samlot in Bat Dambang and Veal Veaeng in Pousat province (ii) Village of Ou Beichoan of Ou Chrov district in Banteay Mean Chey province. The estimated population of these excluded areas is 45,000.

According to provisional tabulation of 1998 census the total population in institutional households, homeless population, boat population and transient population for Cambodia as a whole is 247,844. To make DSC and Census figures comparable, the figure of 247,844 is deducted from the provisional population of 11,426,223 and 45,000 (estimated population in non-censused areas) is added to it. This gives a figure of 11,223,379. It represents an increase of 521,050 during the period March 20, 1996 to March 3, 1998. The annual growth rate (average annual exponential growth rate) of population during 1996-98 works out to 2.44 percent.

The provinces are ranked according to population size in Statement 2.

**Statement 2**
**Ranking of provinces by population size**

| Rank | Province | Percent to Total Population of Cambodia |
|---|---|---|
| 1 | Kampong Cham | 14.1 |
| 2 | Kandal | 9.4 |
| 3 | Phnom Penh | 8.7 |
| 4 | Prey Veaeng | 8.3 |
| 5 | Bat Dambang | 6.9 |
| 6 | Takaev | 6.9 |
| 7 | Siem Reab | 6.1 |
| 8 | Kampong Spueu | 5.2 |
| 9 | Banteay Mean Chey | 5.1 |
| 10 | Kampong Thum | 5.0 |

| | | |
|---|---|---|
| 11 | Kampot | 4.6 |
| 12 | Svay Rieng | 4.2 |
| 13 | Kampong Chhnang | 3.6 |
| 14 | Pousat | 3.2 |
| 15 | Kracheh | 2.3 |
| 16 | Krong Preah Sihanouk | 1.4 |
| 17 | Kaoh Kong | 1.2 |
| 18 | Preah Vihear | 1.0 |
| 19 | Rotanak Kiri | 0.8 |
| 20 | Stueng Traeng | 0.7 |
| 21 | Otdar Mean Chey | 0.6 |
| 22 | Mondol Kiri | 0.3 |
| 23 | Krong Kaeb | 0.2 |
| 24 | Krong Pailin | 0.2 |

The biggest province by population size is Kampong Cham (1.6 million). Krong Pailin is the smallest province with a population of about 23 thousand.

## 2.3 Population Projection

Based on the results of DSC, a study was made by Mr. Jerrold W. Huguet*, wherein he had estimated the population of Cambodia during 1980-96 and projected it upto the year 2020. This was done after adjusting the extrapolated DSC population for under-reporting at ages 0-4 and 20-24 years.

The projected population of Cambodia for the mid-year of 1995 and 2000 according to this study is 10.9 and 12.2 million respectively. The interpolated population works out to 11.6 million as on March 3, 1998, the census date. The difference between the projected population (11.6 million) and the provisional census population (11.4 million) is marginal and can be accounted for by the cumulative effect of several factors such as exclusion of some areas from the census, emigration of refugee population to Thailand (not covered in the census), two different sources of data and assumptions made in the extrapolation of Demographic Survey population and in projection methodology. However, the average annual growth rate of population of 2.4 percent as worked out using DSC and 1998 provisional census figures is the same as projected by Huguet for the period 1995 – 2000. It can, therefore, be concluded that the provisional population at the national level nearly falls in line with the series of projected values in the study. A population projection will be made, when the final population figures with age distribution are available. Till then, Huguet's projections may be considered as valid. For more details on projections, the publication mentioned could be referred to. For immediate reference, an extract from this publication is given in Appendix 4 at the end, which gives the population of Cambodia as obtained by reverse projection for the quinquennial years 1980, 1985, 1990 and 1995 and projected population for the years 2000, 2005, 2010, 2020, 2015 and 2020.

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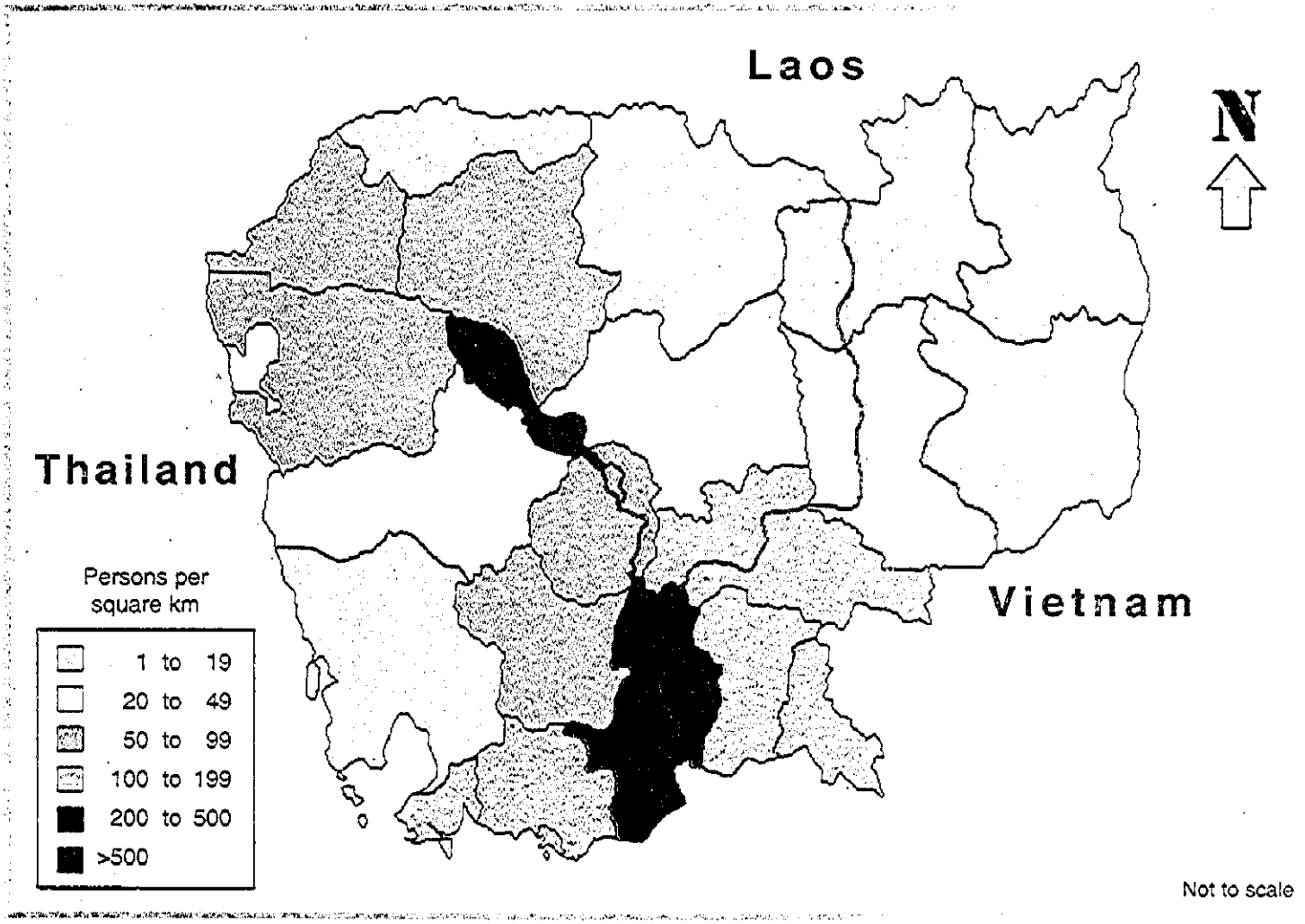
* *"The Population of Cambodia, 1980 – 1996 and Projected to 2020" by Jerrold W. Huguet, Population Division, ESCAP, published by National Institute of Statistics, Ministry of Planning, Phnom Penh.*

## Map 2. Population Density by Province



## 2.4 Size of Household

For working out the size of household, only the regular or normal households are considered. The average household size works out to 5.2 for the country as a whole. The size of household in urban areas (5.5) is higher than that in rural areas (5.1). This pattern was noticed in DSC also. Phnom Penh province (5.7) has the highest size of household. The lowest size of household (4.8) is observed in Prey Veaeng and Svay Rieng. Incidentally, these two provinces have recorded the lowest sex ratios (89). All these point to considerable male out-migration from these provinces. This can, however, be confirmed only when the final census results on migration are available.

## 2.5 Density of Population

One of the important indices of population concentration is the density of population. It is defined as the number of persons per square kilometre. In 1962, the population density was 32. With a density of 64 in 1998, it has doubled between the two censuses. The density of population for each province is given in Statement 3. Phnom Penh which is an important pole of attraction has the highest density (3,441). The lowest density is observed in Mondol Kiri (2).

Cambodia can be broadly divided into four natural regions: Plain, Tonle Sap, Coastal, and, Plateau and Mountain. The average densities in these regions in 1998 are shown in Statement 4. For comparative purposes the corresponding densities in 1963 (after adjusting for jurisdictional changes) are also given. It is interesting to note that though densities have nearly doubled, or more than doubled, the pattern remains the same. In other words, the plain region has the highest density followed by Tonle Sap, Coastal and, Plateau and Mountain regions, in that order. However, there is a wide gap between the degree of concentration of people in the Plain and other regions.

Statement 3
Density of Population, Cambodia and Provinces, 1998

| Cambodia / Province | Area ($Km^2$) | Population | Density (Persons / $Km^2$) |
|---|---|---|---|
| Cambodia | 181,035* | 11,426,223 | 64 |
| Provinces | | | |
| Banteay Mean Chey | 6,679 | 577,300 | 86 |
| Bat Dambang | 11,702 | 791,958 | 68 |
| Kampong Cham | 9,799 | 1,607,913 | 164 |
| Kampong Chhnang | 5,521 | 416,999 | 76 |
| Kampong Spueu | 7,017 | 598,101 | 85 |
| Kampong Thum | 13,814 | 568,454 | 41 |
| Kampot | 4,873 | 527,904 | 108 |
| Kandal | 3,568 | 1,073,586 | 301 |
| Kaoh Kong | 11,160 | 131,912 | 12 |
| Kracheh | 11,094 | 262,945 | 24 |
| Mondol Kiri | 14,288 | 32,392 | 2 |
| Phnom Penh | 290 | 997,986 | 3,441 |
| Preah Vihear | 13,788 | 119,160 | 9 |
| Prey Veaeng | 4,883. | 945,129 | 194 |
| Pousat | 12,692 | 360,291 | 28 |
| Rotanak Kiri | 10,782 | 94,188 | 9 |
| Siem Reab | 10,299 | 695,485 | 68 |
| Krong Preah Sihanouk | 868 | 155,376 | 179 |
| Stueng Traeng | 11,092 | 80,978 | 7 |
| Svay Rieng | 2,966 | 478,099 | 161 |
| Takaev | 3,563 | 789,710 | 222 |
| Otdar Mean Chey | 6,158 | 68,836 | 11 |
| Krong Kaeb | 336 | 28,677 | 85 |
| Krong Pailin | 803 | 22,844 | 28 |

**Includes area of Tonle Sap lake (3,000 $Km^2$)*

*Note: Area figures have been obtained from the Ministry of Interior.*

Statement 4
Density of Population by Natural Regions

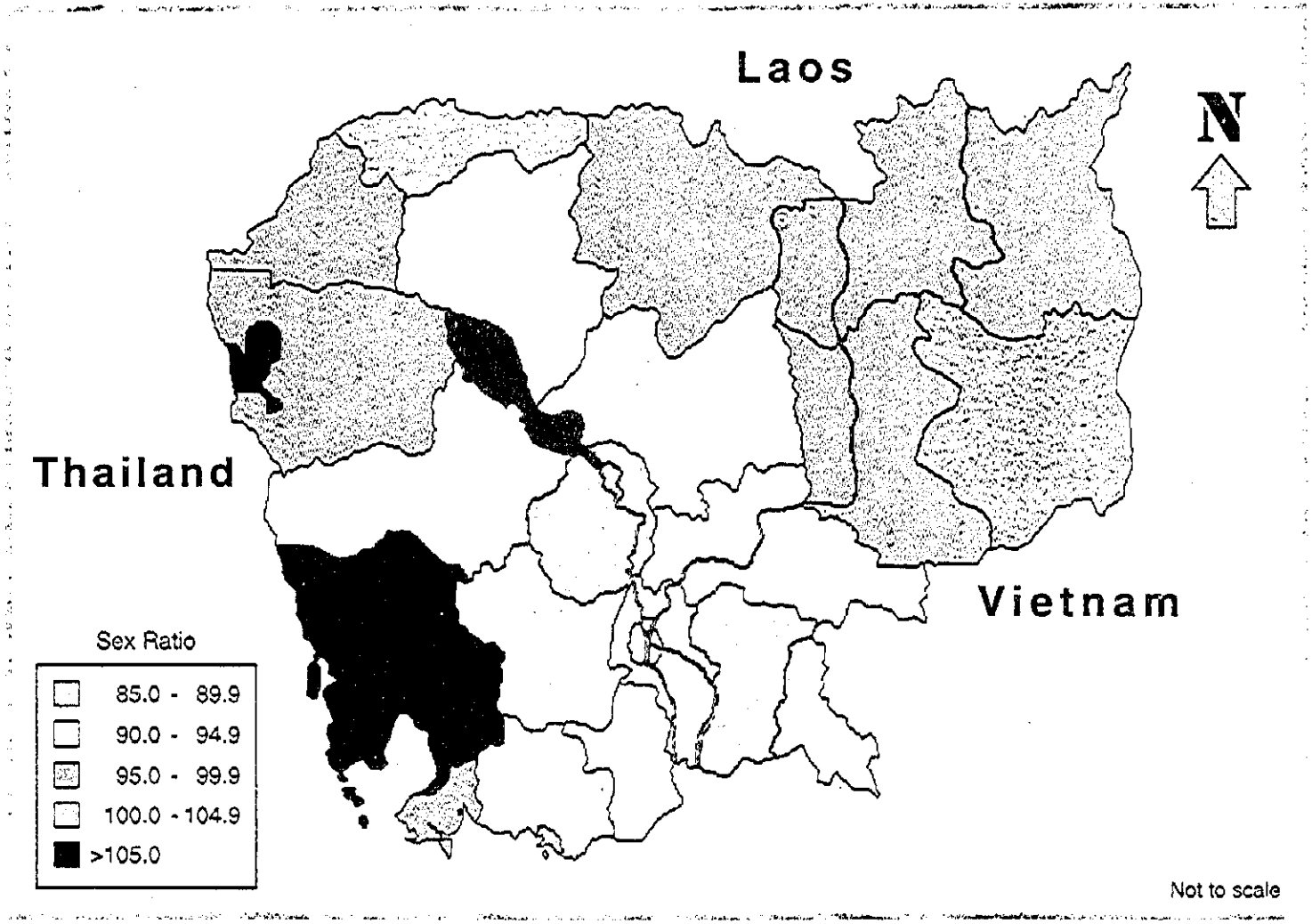
| Natural Regions | Provinces in the region | Average density | | Remarks |
|---|---|---|---|---|
| | | 1998 | 1962 | |
| Plain | Phnom Penh<br>Kandal<br>Kampong Cham<br>Svay Rieng<br>Prey Veaeng<br>Takaev | 235 | 127 | |
| Tonle Sap | Kampong Thum<br>Siem Reab<br>Bat Dambang<br>Pousat<br>Kampong Chhnang<br>Banteay Mean Chey<br>Otdar Mean Chey<br>Krong Pailin | 52 | 24 | |
| Coastal | Krong Preah Sihanouk<br>Kampot<br>Krong Kaeb<br>Kaoh Kong | 49 | 23 | |
| Plateau and Mountain | Kampong Spueu<br>Stueng Traeng<br>Rotanak Kiri<br>Mondol Kiri<br>Kracheh<br>Preah Vihear | 17 | 8 | |

## 2.6 Sex Composition of the Population

In any study on population, analysis of the sex composition plays a vital role. The sex composition of the population is affected by differentials in the mortality conditions of males and females, sex selective migration and the sex ratio at birth.

The sex ratio, the principal measure of sex composition is defined as the number of males per 100 females in the population. The trends in the sex ratio in Cambodia from 1962 may be seen in Statement 5.

## Map 3. Sex Ratio by Province



Statement 5
Sex Ratio in Cambodia over the years

| Source of information | Sex Ratio |
|---|---|
| 1962 Census | 99.9 |
| 1980 General Demographic Survey | 86.1 |
| 1993-94 Socio-Economic Survey of Cambodia | 91.4 |
| 1996 Demographic Survey | 91.7 |
| 1998 Census | 93.1 |

A sex ratio of hundred denotes a point of balance of the sexes. Greater the excess of males the higher the sex ratio; the greater the excess of females, the lower the sex ratio. In general, sex ratio of a population tends to fall in the narrow range from about 95 to 102 except in special circumstances such as history of heavy war losses or heavy immigration. National sex ratios outside the range of 90 to 105 are to be viewed as extreme. With this background it could be stated that the sex ratio was ideally balanced in Cambodia in 1962. It drastically fell to 86 in 1980, probably due to heavy mortality among men. From that year onwards it is showing an increasing trend reaching 93 in 1998. Fourteen provinces have registered a sex ratio higher than the national average of 93.1. In fact Kaoh Kong, Mondol Kiri, Otdar Mean Chey and Krong Pailin have recorded a sex ratio more than 100 each. The highest sex ratio has been recorded in Krong Pailin (117.9) which has recently joined the rest of Cambodia, having been under Khmer Rouge occupation for long. The lowest sex ratio (89) has been recorded by Prey Veaeng and Svay Rieng.

Sex ratio is higher (96.0) in urban areas than that in rural areas (92.6). This could be due to male-selective migration to urban from rural areas. This trend is true of all provinces except Banteay Mean Chey, Bat Dambang, Preah Vihear and Pousat where it is reversed. A detailed analysis of the sex ratio could be made once the final census figures are available.

## 2.7 Urban Population

For the purpose of the census all provincial towns (headquarters of the 24 provinces) have been treated as urban areas. In the case of Phnom Penh province (which is treated as a Municipality), four out of seven districts are treated as urban. Krong Preah Sihanouk, Krong Kaeb and Krong Pailin are totally urban. The population figures of urban areas in each province is given in Provisional Table 1.1.

The percentage of urban population in Cambodia works out to 15.7 percent. In other words, the rural population is more than five times bigger than the urban population. About 84 percent of the people live in rural areas. It may be of interest to note that in the 1962 census, the urban population constituted 10.3 percent of the total population of Cambodia. At that time, Phnom Penh, three other Municipalities of Kaeb, Bokor and Sihanuok Ville and 14 urban centres in provinces were treated as urban and the rest of the country was treated as rural.

The DSC estimated the percentage of urban population as 14.4. The increase of 1.3 percent between DSC and the census could be explained as follows:- DSC did not include institutional households, homeless persons and transient population who are found in large numbers in urban areas. Added to this could be the exclusion of squatter settlements and unauthorised areas in DSC though they are to be covered by sample design.

A detailed study of urbanisation could be made after the release of final census figures with data on age distribution, literacy and education, migration and economic activity of the population.

## Provisional Table 1. Number of Households and Population by Province and Sex

| Province | Number of Households | Population | | | Sex Ratio | Average Household Size (*) |
|---|---|---|---|---|---|---|
| | | Both Sexes | Males | Females | | |
| Cambodia – Total | 2,187,238 | 11,426,223 | 5,509,204 | 5,917,019 | 93.1 | 5.2 |
| Banteay Mean Chey | 111,866 | 577,300 | 283,242 | 294,058 | 96.3 | 5.1 |
| Bat Dambang | 148,315 | 791,958 | 388,338 | 403,620 | 96.2 | 5.3 |
| Kampong Cham | 313,019 | 1,607,913 | 775,329 | 832,584 | 93.1 | 5.1 |
| Kampong Chhnang | 82,452 | 416,999 | 197,299 | 219,700 | 89.8 | 5.0 |
| Kampong Spueu | 115,576 | 598,101 | 287,299 | 310,802 | 92.4 | 5.1 |
| Kampong Thum | 106,835 | 568,454 | 272,676 | 295,778 | 92.2 | 5.3 |
| Kampot | 104,920 | 527,904 | 252,818 | 275,086 | 91.9 | 5.0 |
| Kandal | 205,992 | 1,073,586 | 515,809 | 557,777 | 92.5 | 5.2 |
| Koah Kong | 24,962 | 131,912 | 67,629 | 64,283 | 105.2 | 5.2 |
| Kracheh | 49,297 | 262,945 | 130,021 | 132,924 | 97.8 | 5.3 |
| Mondol Kiri | 5,673 | 32,392 | 16,367 | 16,025 | 102.1 | 5.6 |
| Phnom Penh | 173,232 | 997,986 | 481,385 | 516,601 | 93.2 | 5.7 |
| Preah Vihear | 21,481 | 119,160 | 59,232 | 59,928 | 98.8 | 5.5 |
| Prey Veaeng | 194,019 | 945,129 | 445,139 | 499,990 | 89.0 | 4.8 |
| Pousat | 68,206 | 360,291 | 172,945 | 187,346 | 92.3 | 5.2 |
| Rotanak Kiri | 16,754 | 94,188 | 46,399 | 47,789 | 97.1 | 5.6 |
| Siem Reab | 127,086 | 695,485 | 336,740 | 358,745 | 93.9 | 5.4 |
| Krong Preah Sihanouk | 28,013 | 155,376 | 76,858 | 78,518 | 97.9 | 5.5 |
| Stueng Traeng | 14,304 | 80,978 | 40,115 | 40,863 | 98.2 | 5.6 |
| Svay Rieng | 98,219 | 478,099 | 225,094 | 253,005 | 89.0 | 4.8 |
| Takaev | 154,971 | 789,710 | 377,037 | 412,673 | 91.4 | 5.1 |
| Otdar Mean Chey | 12,563 | 68,836 | 35,027 | 33,809 | 103.6 | 5.3 |
| Krong Kaeb | 5,367 | 28,677 | 14,046 | 14,631 | 96.0 | 5.3 |
| Krong Pailin | 4,116 | 22,844 | 12,360 | 10,484 | 117.9 | 5.2 |

*(*) Based on Normal or Regular Households*

*Note:*

*Census enumeration could not be held in the following areas due to conflict*

*(i) Whole districts of Anlong Veaeng in Otdar Mean Chey province, Samlot in Bat Dambang province and Veal Veaeng in Pousat province.*

*(ii) Ou Bei Choan village of Ou Chrov district in Banteay Mean Chey province. The estimated population of these excluded areas is 45,000*

## Provisional Table 1.1 Number of Households and Population by Province and Sex

| Province | Number of Households | Population | | | Sex Ratio | Average Household Size (*) |
|---|---|---|---|---|---|---|
| | | Both Sexes | Males | Females | | |
| Cambodia – Urban | 321,881 | 1,794,029 | 878,606 | 915,423 | 96.0 | 5.5 |
| Banteay Mean Chey | 18,377 | 98,709 | 48,062 | 50,647 | 94.9 | 5.3 |
| Bat Dambang | 25,572 | 139,699 | 67,563 | 72,136 | 93.7 | 5.3 |
| Kampong Cham | 8,225 | 45,326 | 22,077 | 23,249 | 95.0 | 5.4 |
| Kampong Chhnang | 7,690 | 41,679 | 20,107 | 21,572 | 93.2 | 5.3 |
| Kampong Speu | 7,577 | 41,521 | 20,343 | 21,178 | 96.1 | 5.4 |
| Kampong Thum | 12,295 | 66,014 | 32,095 | 33,919 | 94.6 | 5.3 |
| Kampot | 6,051 | 33,073 | 15,930 | 17,143 | 92.9 | 5.4 |
| Kandal | 10,263 | 58,227 | 28,745 | 29,482 | 97.5 | 5.5 |
| Koah Kong | 5,403 | 29,327 | 15,181 | 14,146 | 107.3 | 5.3 |
| Kracheh | 14,781 | 79,038 | 39,170 | 39,868 | 98.2 | 5.3 |
| Mondol Kiri | 1,275 | 7,035 | 3,584 | 3,451 | 103.9 | 5.5 |
| Phnom Penh | 96,984 | 569,192 | 277,062 | 292,130 | 94.8 | 5.8 |
| Preah Vihear | 4,130 | 21,600 | 10,705 | 10,895 | 98.3 | 5.2 |
| Prey Veaeng | 10,903 | 54,975 | 26,252 | 28,723 | 91.4 | 5.0 |
| Pousat | 10,839 | 57,473 | 27,409 | 30,064 | 91.2 | 5.2 |
| Rotanak Kiri | 3,192 | 17,010 | 8,598 | 8,412 | 102.2 | 5.3 |
| Siem Reab | 20,980 | 119,484 | 58,625 | 60,859 | 96.3 | 5.6 |
| Krong Preah Sihanouk | 28,013 | 155,376 | 76,858 | 78,518 | 97.9 | 5.5 |
| Stueng Traeng | 4,431 | 24,486 | 12,345 | 12,141 | 101.7 | 5.5 |
| Svay Rieng | 4,106 | 21,157 | 10,242 | 10,915 | 93.8 | 5.1 |
| Takaev | 7,248 | 39,145 | 18,987 | 20,158 | 94.2 | 5.4 |
| Otdar Mean Chey | 4,063 | 22,962 | 12,260 | 10,702 | 114.6 | 5.4 |
| Krong Kaeb | 5,367 | 28,677 | 14,046 | 14,631 | 96.0 | 5.3 |
| Krong Pailin | 4,116 | 22,844 | 12,360 | 10,484 | 117.9 | 5.2 |

*(*) Based on Normal or Regular Households*

Note:

*Census enumeration could not be held in the following areas due to conflict:*
*(i) Whole districts of Anlong Veaeng in Otdar Mean Chey province, Samlot in Bat Dambang province and Veal Veaeng in Pousat province.*
*(ii) Ou Bai Choan village of Ou Chrov district in Banteay Mean Chey province. The estimated population of these excluded areas is 45,000.*

## Provisional Table 1.2 Number of Households and Population by Province and Sex

| Province | Number of Households | Population | | | Sex Ratio | Average Household Size (*) |
|---|---|---|---|---|---|---|
| | | Both Sexes | Males | Females | | |
| Cambodia – Rural | 1,865,357 | 9,632,194 | 4,630,598 | 5,001,596 | 92.6 | 5.1 |
| Banteay Mean Chey | 93,489 | 478,591 | 235,180 | 243,411 | 96.6 | 5.1 |
| Bat Dambang | 122,743 | 652,259 | 320,775 | 331,484 | 96.8 | 5.2 |
| Kampong Cham | 304,794 | 1,562,587 | 753,252 | 809,335 | 93.1 | 5.1 |
| Kampong Chhnang | 74,762 | 375,320 | 177,192 | 198,128 | 89.4 | 5.0 |
| Kampong Speu | 107,999 | 556,580 | 266,956 | 289,624 | 92.2 | 5.1 |
| Kampong Thum | 94,540 | 502,440 | 240,581 | 261,859 | 91.9 | 5.3 |
| Kampot | 98,869 | 494,831 | 236,888 | 257,943 | 91.8 | 5.0 |
| Kandal | 195,729 | 1,015,359 | 487,064 | 528,295 | 92.2 | 5.2 |
| Koah Kong | 19,559 | 102,585 | 52,448 | 50,137 | 104.6 | 5.1 |
| Kracheh | 34,516 | 183,907 | 90,851 | 93,056 | 97.6 | 5.3 |
| Mondol Kiri | 4,398 | 25,357 | 12,783 | 12,574 | 101.7 | 5.7 |
| Phnom Penh | 76,248 | 428,794 | 204,323 | 224,471 | 91.0 | 5.5 |
| Preah Vihear | 17,351 | 97,560 | 48,527 | 49,033 | 99.0 | 5.6 |
| Prey Veaeng | 183,116 | 890,154 | 418,887 | 471,267 | 88.9 | 4.8 |
| Pousat | 57,367 | 302,818 | 145,536 | 157,282 | 92.5 | 5.2 |
| Rotanak Kiri | 13,562 | 77,178 | 37,801 | 39,377 | 96.0 | 5.7 |
| Siem Reab | 106,106 | 576,001 | 278,115 | 297,886 | 93.4 | 5.4 |
| Krong Preah Sihanouk | - | - | - | - | - | - |
| Stueng Traeng | 9,873 | 56,492 | 27,770 | 28,722 | 96.7 | 5.7 |
| Svay Rieng | 94,113 | 456,942 | 214,852 | 242,090 | 88.7 | 4.8 |
| Takaev | 147,723 | 750,565 | 358,050 | 392,515 | 91.2 | 5.1 |
| Otdar Mean Chey | 8,500 | 45,874 | 22,767 | 23,107 | 98.5 | 5.3 |
| Krong Kaeb | - | - | - | - | - | - |
| Krong Pailin | - | - | - | - | - | - |

*(*) Based on Normal or Regular Households*

*Note:*

*Census enumeration could not be held in the following areas due to conflict.*

*(i) Whole districts of Anlong Veaeng in Otdar Mean Chey province, Samlot in Bat Dambang province and Veal Veaeng in Pousat province.*

*(ii) Ou Bei Choan village of Ou Chrov district in Banteay Mean Chey province. The estimated population of these excluded areas is 45,000.*

Appendix 1

GENERAL POPULATION CENSUS, 1998
ENUMERATOR'S SUMMARY

Page No.: .....
Total number of pages for the EA.: .....

( To be entered from Columns of Form B Part 2 as indicated)

Identification Particulars

Form 2:

| | Khet / Krong | | Srok / Khand | | Khum / Sangkat | | Phum / Mondol | | Enumeration Area No. | |
|---|---|---|---|---|---|---|---|---|---|---|
| Name | | | | | | | | | | |
| Code | | | | | | | | | | |

| Line No. | Building No. | House-hold No. | No. of Question-naires used | Population | | | Type of Household/ Population 1: Normal or Regular Household 2: Institutional Household 3: Homeless Household 4: Boat Population 5: Transient Population *(Enter Code)* | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | Males | Females | Persons | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| Page Total | | @ | | | | | | |
| Grand Total for EA* | | | | | | | | |

Name of Enumerator: ..... Signature: ..... Date: ...../...../.....

Name of Supervisor: ..... Signature: ..... Date: ...../...../.....

@ Count the number of households and give that total here.
* *Give Grand Total for EA in the last page of Form 2 after adding page total of each Column.*

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FORM A HOUSELIST

# Royal Government of Cambodia
# General Population Census of Cambodia, 1998

Page Number .....
Total Number of pages for the EA .....

**Identification Particulars**

| | Khet / Krong | Srok / Khand | Khum / Sangkat | Phum / Mondol | Enumeration Area No. |
|---|---|---|---|---|---|
| Name | | | | | |
| Code | | | | | |

**Building / Structure and Household Particulars**

| Line No. | Building / Structure Number | Predominant construction material of Building / Structure* | | | Purpose of Building / Structure<br>1: Residence<br>2: Residence & Shop<br>3: Residence & Workshop<br>4: Residence & any other establishment (specify)<br>*(Enter Code)* | Household No. | Particulars of Head of Household | | Number of persons usually living in the household | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Wall | Roof | Floor | | | Name | Sex<br>1: Male<br>2: Female<br>*(Enter Code)* | Males | Females | Persons | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | |
| | | | | | *(** Count the number of entries and give total)* | **Total | | Total | | | | |

*KEY TO CODES

**Wall Material (Column 3)**
1. Bamboo / Thatch / Grass / Reeds
2. Earth
3. Wood / Plywood
4. Concrete / Brick / Stone
5. Galvanised Iron / Aluminium / Other metal sheets
6. Asbestos cement sheets
7. Salvaged / Improvised materials
8. Other (specify)

**Roof Material (Column 4)**
1. Bamboo / Thatch / Grass
2. Tiles
3. Wood / Plywood
4. Concrete / Brick / Stone
5. Galvanised Iron / Aluminium /Other metal sheets
6. Asbestos cement sheets
7. Plastic / Synthetic material sheets
8. Other (specify)

**Floor Material (Column 5)**
1. Earth / Clay
2. Wood / Bamboo planks
3. Cement / Brick / Stone
4. Polished stone
5. Parquet / Polished wood
6. Mosaic / Ceramic tiles
7. Other (specify)

Name of Enumerator: .....

Signature ____/____/____ Date

Name of Supervisor: .....

Signature ____/____/____ Date

# Royal Government of Cambodia
# General Population Census of Cambodia, 1998

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FORM B HOUSEHOLD QUESTIONNAIRE PART 1

**Identification Particulars**

| | Khet / Krong | Srok / Khand | Khum / Sangkat | Phum / Mondol | Enumeration Area No. | Building No. | Household No. | Name of Head of Household |
|---|---|---|---|---|---|---|---|---|
| Name | | | | | | | | |
| Code | | | | | | | | |

**Population Particulars**

**Statement 1.1: Usual Members Present on Census Night**

| Type of Household / Population (Give appropriate code in the box below) | Sl. No. | Full Name | Relationship to Head of Household | Sex 1: Male 2: Female (Enter Code) |
|---|---|---|---|---|
| 1: Normal or Regular Household | | 2 | 3 | 4 |
| 2: Institutional Household* | 1 | | | |
| 3: Homeless Household* | 2 | | | |
| 4: Boat Population* | 3 | | | |
| 5: Transient Population* (Specify location) | 4 | | | |
| ..... | 5 | | | |
| | 6 | | | |
| | 7 | | | |
| | 8 | | | |
| | 9 | | | |
| | 0 | | | |

**Statement 1.2: Visitors Present on Census Night**

| Sl. No. | Full Name | Relationship to Head of Household | Sex 1: Male 2: Female (Enter Code) | Usual Residence | |
|---|---|---|---|---|---|
| | | | | Within Cambodia Give name of district and write name of province within brackets | Outside Cambodia Give name of country |
| | 2 | 3 | 4 | 5 | |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 0 | | | | | |

**Statement 1.3: Usual Members Absent on Census Night**

| Sl. No. | Full Name | Relationship to Head of Household | Sex 1: Male 2: Female (Enter Code) | Age | Location on Census Night | | How long Absent (in completed months) Write 0 for less than 1 month |
|---|---|---|---|---|---|---|---|
| | | | | | Within Cambodia Give name of district and write name of province within brackets | Outside Cambodia Give name of country | |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

| Total No. of Persons in Statement 1.1 |
|---|
| |
| **Total No. of Persons in Statement 1.2** |
| |
| **Total No. of Persons in Statements 1.1 and 1.2** |
| |

Number of Form B used for the Household

**In these cases, fill-in only Identification Particulars.*
*Population Particulars in Statements 1.1, 1.2 and 1.3 are not to be collected in these cases.*

| | Name | Signature | Day Month Year |
|---|---|---|---|
| Enumerator: | ..... | ..... | ../../.. |
| Supervisor: | ..... | ..... | ../../.. |

FORM B HOUSEHOLD QUESTIONNAIRE PART 2: INDIVIDUAL PARTICULARS

FOR ALL PERSONS

| Sl. No. | Full Name | Relationship | Sex | Age | Marital Status | Mother Tongue | Religion | Birth Place | Previous Residence | Duration of Stay | Reason for Migration |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 11 | 12 |
| | Names of Usual Members Present and Visitors<br><br>(Please refer to Statements 1.1 and 1.2 in Part 1) | Relationship to Head of Household<br><br>*(Enter Code from list below)* | 1: Male<br><br>2: Female<br><br>*(Enter Code)* | Age in completed years<br>00: Less than 1 year<br>01: 1 year<br>02: 2 years<br><br>97: 97 years<br>98: 98 years and over | Marital Status<br>1: Never Married<br>2: Married<br>3: Widowed<br>4: Divorced<br>5: Seperated<br><br>*(Enter Code)* | Mother Tongue<br>1: Khmer<br>2: Vietnamese<br>3: Chinese<br>4: Lao<br>5: Thai<br>6: French<br>7: English<br>8: Other (specify) | Religion<br>1: Buddhism<br>2: Islam<br>3: Christianity<br>4: Other (specify) | Place of Birth<br>If in this village, enter code 1.<br><br>If in another village, give name of district of that village and write name of province within brackets.<br><br>If outside Cambodia, write name of country. | Where have you been living before?<br>If always lived in this village, enter code 1 and skip to 13<br><br>If in another village give name of district of that village and write name of province within brackets.<br><br>If outside Cambodia write name of Country. | How long have you lived in this village?<br><br>*(Enter Code from list below)* | Give reason for change of residence, if present residence is different from previous residence *(Enter Code from list below)* |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 0 | | | | | | | | | | | |

**Codes for Column 3**
**Relationship to Head of Household**

1: Head
2: Wife / Husband
3: Son / Daughter
4: Father / Mother
5: Grand Child
6: Other Relative
7: Non-relative

**Codes for Column 11**
**Duration of Stay**

00: Less than 1 year
01: 1 to less than 2 years
02: 2 to less than 3 years
.
.
10: 10 to less than 11 years
.
20: 20 to less than 21 years
.
97: 97 to less than 98 years
98: 98 years and over

**Codes for Column 12**
**Reason for Migration**

1: Transfer of work place
2: In search of employment
3: Education
4: Marriage
6: Family moved
5: Natural calamities or insecurity
7: Repatriation or Return after displacement
8: Visiting only
9: Other (specify)

## FOR ALL PERSONS

| Literacy | Full Time Education | | Main Activity | Employment Period | Occupation | Employment Status | Industry, Trade or Service | Sector of Employment |
|---|---|---|---|---|---|---|---|---|
| 13 | 14 | | 15 | 16 | 17 | 18 | 19 | 20 |
| Can you read and write with understanding in any language?<br><br>1: Yes<br>2: No<br><br>*(Enter Code)* | ( a )<br>Have you ever attended School/ Educational Institution?<br><br>1: Never<br>2: Now<br>3: Past<br>*(Enter Code)* | ( b )<br>What is the highest grade completed?<br><br>*(Enter Code from list below)* | Main activity during last year<br><br>*(Enter Code from list below)* | No. of months employed in the last 12 months | Name of Occupation | Employment Status / Class<br><br>*(Enter Code from list below)* | Nature of Industry, Trade or Service | Sector in which Employed<br><br>*(Enter Code from list below)* |
| | | | | | | | | |
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Codes for Column 14 (b)
What is the highest grade completed?

For Never in 14 (a) put dash ( - )
For Now or Past in 14 (a), Code as follows:-
00: No class completed
01: Class 1 completed
02: Class 2 completed

11: Class 11 completed
12: Class 12 completed
13: Secondary School / Certificate / Diploma
14: Undergraduate
15: Graduate / Degree holder
16: Postgraduate
17: Other (specify)

Codes for Column 15
Main Activity During Last Year

1: Employed (Fill in Cols. 16 to 20)
2: Unemployed (Employed any time before)
(Fill in Cols. 16 to 20 for last employment)
3: Unemployed (Never employed any time before)
Inactive
4: Home maker
5: Student
6: Dependent
7: Rent-receiver, Retired or other income recipient
8: Other (Specify)
(For codes 3 to 8, put dash ( - ) in Cols. 16 to 20)

Codes for Column 18
Employment Status

1: Employer
2: Paid employee
3: Own - account worker
4: Unpaid family worker
5: Other (specify)

Codes for Column 20
Sector of Employment

1: Government
2: State-owned enterprise (Parastatal)
3: Cooperative
4: Private
5: Other (specify)



Appendix – 3 (Continued)

FORM B: HOUSEHOLD QUESTIONNAIRE PART 3: FERTILITY INFORMATION OF FEMALES AGED 15 AND OVER LISTED IN COLUMN 2 OF PART 2

| Sl. No. | Full Name | Sl No. in Col. 1 of Part 2 | Fertility Information | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | | | | | | | 5 | |
| | | | Number of Children Born (Give number in two digits like 01, 02, .....10, 11 etc. If none, write 00) | | | | | | | | Particulars of Birth in the last 12 months | |
| | | | How many children have been born alive to the woman ? | | | | How many of them are living? | | | | How many of them have died? | | | | Any child born alive to the woman during the last 12 months? (Give actual number like 1,2 ... If none, write 0) | |
| | | | (a) Male | | (b) Female | | (c) Male | | (d) Female | | (e) Male | | (f) Female | | Male | Female |
| 1 | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | | | |

FORM B HOUSEHOLD QUESTIONNAIRE PART 4: HOUSING CONDITIONS AND FACILITIES**

*(Enter Code in the box below)*

| On what basis does the household occupy this dwelling? | Main source of light | Main cooking fuel | Toilet facility within premises | Main source of drinking water supply | No. of rooms occupied by household (exclude kitchen, bathroom, toilet and storeroom) |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1: Owner occupied<br>2: Rent<br>3: Not owner, but rent free<br>4: Other (specify)<br>..... ☐ | 1: City power<br>2: Generator<br>3: Both city power and generator<br>4: Kerosene<br>5: Candle<br>6: Battery<br>7: Other (specify) ☐<br>..... | 1: Firewood<br>2: Charcoal<br>3: Kerosene<br>4: Liquefied Petroleum Gas (LPG)<br>5: Electricity<br>6: None<br>7: Other (specify) ☐<br>..... | 1: Available<br>2: Not available ☐ | 1: Piped water<br>2: Tube / pipe well<br>3: Dug well<br>4: Spring, river, stream, lake / pond, rain<br>5: Bought<br>6: Other (specify) ☐<br>..... | 1: One Room<br>2: Two Rooms<br>3: Three Rooms<br>4: Four Rooms<br>5: Five Rooms<br>6: Six Rooms<br>7: Seven Rooms<br>8: Eight Rooms and above ☐ |

**Part 4 need not be filled-in for Institutional and Homeless Households and for Boat and Transient Population.

**Appendix 4**

Population as obtained by reverse projection for 1980-95 and projected population upto 2020.

| Year* | Population | | |
|---|---|---|---|
| | Persons | Males | Females |
| 1980 | 6,549,687 | 3,038,638 | 3,511,049 |
| 1985 | 7,803,920 | 3,688,702 | 4,115,218 |
| 1990 | 9,144,806 | 4,375,024 | 4,769,782 |
| 1995 | 10,863,152 | 5,226,046 | 5,637,106 |
| 2000 | 12,226,613 | 5,892,848 | 6,333,767 |
| 2005 | 13,756,025 | 6,649,486 | 7,106,540 |
| 2010 | 15,500,001 | 7,520,082 | 7,979,919 |
| 2015 | 17,382,632 | 8,466,320 | 8,916,311 |
| 2020 | 19,295,178 | 9,434,049 | 9,861,130 |

** refers to midyear*

*Source:- "The population of Cambodia, 1980-1996, and projected to 2020" by Jerrold W. Huguet. Published by the National Institute of Statistics, Ministry of Planning, Phnom Penh, Cambodia, May 1997.*

2. Base Line Study Science and Mathematics Education Cambodia, October 1998, PMMU, MoEYS

**Royal Government of Cambodia**

Ministry of Education
Youth and Sport

# Base Line Study
# Science and Mathematics Education
# Cambodia

PMMU
October, 1998

**Note**

The purpose of this research was to assist the Royal Government of Cambodia and other agencies to improve science development planning and implementation in Cambodia.
It is a study that is intended to learn from people and not to provide immediate assistance.
The interpretation of Baseline Study used for this study is:

> **a document for beginning to think about a project intervention..**
>
> *(Choosing Research Methods, Brian Pratt & Peter Loizos 1992)*

During the course of interviews with organisations with involvement in science and mathematics it has become clear that there is a need to summarise the main findings and to present these as a series of recommendations.

It is hoped that this study will help to guide future thinking regarding the development of science and mathematics education in Cambodia and the implication of such decisions within the context of the real-situation for MoEYS and other organisations.

There is also a need to clarify the involvement of organisations with involvement and to document clearly the extent and type of support that has been provided

For these reasons the resultant exercise goes beyond the provision of a situation analysis on science and mathematics education in Cambodia.

It is the wish of PMMU that this report be accepted as a learning document leading to a wider understanding of the overall situation in science and mathematics.

The report has been divided into 5 main sections.

I. Executive Summary & Recommendations

II. Introduction

III. Research methodology

IV. Results and Discussion

V. Commentary

*Acknowledgements*

A significant number of people have provided support in the completion of this report and PMMU would like to thank them for their assistance.

| | |
|---|---|
| P.O.E. in Kandal Province and Phnom Penh Municipality | MoEYS |
| Directors in observed schools. | MoEYS |
| Science & maths teachers in Kandal & Phnom Penh | MoEYS |
| PMMU | MoEYS |
| Martin Ferns | BETP |
| Bob McLaughlin | CARE |
| Louise Ahhearns | MARYKNOLL |
| APSO volunteers | UPP |
| Lucy Royal-Dawson, George Taylor & Lor Char Vanna | CAMSET |
| Lucia D'Emilio, Linda Peer-Groves | UNICEF |
| Dr Supote Prasertsri | UNESCO |
| Richard Geeves | World Education |
| Michael Bevis, Sue Gollifer | V.S.O. |

## I Executive Summary

At the present time there is no holistic statement of the goals and objectives for science education in Cambodia.

RECOMMENDATIONS

- The development of comprehensive guiding principles for science and mathematics education in Cambodia.
- The development of a Science & Mathematics Master Plan.

*Methodology*

There are inconsistent interpretations as to what constitutes student centred teaching and learning.

RECOMMENDATION

- Round table discussions between MoEYS and others with involvement in science education to establish understanding of the MoEYS interpretation of student centred teaching and learning.

There is a current conflict regarding donor perception of need within science within the context of the 'real situation' in Cambodia and a resultant confusion regarding needs delivery through the curriculum, particularly in science.
This has led in some cases to situations where areas of duplication or omission have occurred.
There is currently an uneven emphasis on teacher rather than student needs which although not suprising leads to a tendency to view interventions from a one-dimensional approach.

RECOMMENDATIONS

- MoEYS to ensure that the real situation and needs are made explicit and clearly understood when considering project assistance for science education.
- There needs to be a shared development of guiding principles.
- Project proposals for intervention should be examined from a micro as well as a macro-perspective.
- Review of the appropriateness of an holistic transfer towards purely student-centred approaches to teaching and learning.

*Curriculum*

The current science programme is not a coherent, unified & logical process and students are currently receiving their science and mathematics education outside of a meaningful context. It is not clear to them or the teachers how this information can be tied together in a meaningful way and how their knowledge can be used to address the daily situation in which they find themselves.

There needs to be a clearly defined set of goals and learning objectives built into the curriculum that will support the development of a syllabus for science education and this in turn will further support future developments regarding standardised assessment.

Teachers need ideas for teaching activities based on the applications of science in their teaching & learning and allowing for the use of naturally occurring local resources.

This practical support for teachers is an important issue in order to avoid perpetuating the cycle of future generations of science teachers with no practical experience of science.

There has been no curriculum mapping to identify the needs of a science curriculum related to preparation for life beyond Grade 9 – this is problematic given that there will always be a need for a cadre of highly qualified university graduates to ensure the technological & scientific development of the country.

The lack of curriculum mapping has meant that the science curriculum has been prepared from the bottom up with little or no idea of the end point.

The science curriculum specifically, has received very limited technical assistance to date other than that which has been provided as a product of other project interventions. As more attention is paid to the development of science education, there will be much more focus on these needs.

There has been uneven liaison and communication amongst the donor community involved in science and maths education, particularly in science and this has meant that there has been duplication of some interventions and the creation of gaps where there has been a lack of clarification of the roles played by those involved.

There is no curriculum unit to focus on design, development and implementation and the roles of the curriculum writers have become merged with those of the textbook writers so that the curriculum has not developed as a set of statutory guidelines and the textbook writers have had a limited framework within which to develop student learning objectives.

RECOMMENDATIONS

- A list of priorities for science education drawn up by MoBYS for use in identifying possible areas for project intervention.
- The development of a curriculum unit within PRD who are separate and distinct from the textbook writers.
- A group of curriculum writers be identified to work on a curriculum review and curriculum mapping exercise with T.A.
- Curriculum mapping to identify:
  - Desired subject coverage from Grades 1 – 12.
  - Specific learning objectives.
  - Student competencies to guide the development of assessment tools.
  - Opportunities for application based practical experiences.
  - Identification of appropriate teaching methodology.
- Assessment of the appropriateness of the T.O.P.
- Institutional strengthening aimed at the development of an infrastructure to support developments in science education.
- Development of closer links to enable the promotion of shared understandings of curriculum and teaching pedagogy.
- Technical assistance for inspectors to promote subject specific awareness of appropriate teaching methodologies.

*Textbooks*

The textbook has become synonymous with curriculum and whilst at this stage of textbook development this is not totally inappropriate future developments in science and textbook development need to take place within a more clearly defined structure.
This structure would support the existence of a curriculum, syllabi for teaching the curriculum and a textbook and teachers manual to support the teaching & learning.
The lack of an official translation of the new textbooks so that donor projects can appropriately target and address needs has become increasingly problematic and assistance, whilst valuable, has been less effective in targeting need than would be the case with this translation.

The lack of comprehensive trialling of the new textbooks has undoubtedly caused problems associated with lack of accuracy, particularly in science which could have been identified through a trialling process and prior to whole-scale production.
The capacity to edit the textbooks in science is slowly evolving and subsequent textbook developments will show increased awareness of the needs of developing new materials.
The lack of a curriculum map to guide writers as to the needs within each grade has been identified as a main area of concern and this need will only become more pronounced as the pressure for Grades 10-12 are added.
Popov (UNICEF, July 1998) recommended a delay of two years on textbook development for Years 10-12, and although this timescale may be seen as unrealistic there is a serious need to learn from the experiences within Grades1 – 9 and not repeat the same errors.
The completion of a curriculum mapping exercise is not a lengthy process but it is one, which will be invaluable for the sustainability of the textbook production process, particularly in terms of wastage.
The restrictions placed on nos. of pages *for example* has proved problematic for science writers. Editing to take this into account has resulted in some confusion and a compromise on the quality of materials produced.
**Teachers ability to use the textbook will increase greatly if the books contain methodological suggestions.*
*Current teacher manuals contain background information but not enough teaching suggestions to be considered useful.*

RECOMMENDATIONS

- A statement of goals & aims to be clearly determined to guide writers.
- A translation made available of the science textbooks.
- Learning objectives and outcomes identified to provide a successful science curriculum.
- The addition of logical sequencing of age-appropriate content built in to existing curriculum.
- Review of the textbooks and Teacher's Manual to take into account:
  - Incorporation of clearly stated learning objectives.
  - Repetition of the same subject content in different grade level books.
  - Age appropriate content and level & with teaching methodologies taken into consideration.
  - Inclusion of suggestions on the use of naturally occurring materials for resource purposes.

*Teacher Education*

The area of teacher education was outside the objectives of this baseline study, however interviews with organisations and with science and mathematics teachers themselves together with lesson observations on teaching & learning suggest that this is an area of great need.

The dependence on the provision of INSETT has been a necessary factor in the upgrading of existing teachers knowledge, however, this needs to be balanced carefully against the constant annual emergence of science and mathematics teachers with fundamentally weak training, specifically in terms of the application of science.

This will mean that there will forever be a need for INSETT based at a most basic level.

There needs to be intervention in the form of attention to PRESETT in science and mathematics to enable the implementation of change within the culture of science and mathematics to be addressed.

There needs to be acceptance that INSETT is not the only way of managing change.

The more subtle and long term changes may be brought about by the emergence of a new cadre of science and mathematics teachers with a practical and applications approach who can function effectively within all schools.

Managers of institutions have many tools at their disposal to improve teaching and learning and one of these is to influence existing practice with the demonstration of new approaches. A training force of teachers who approach their teaching from a different perspective will allow for sharing of good practice and will support change from within schools with external assistance in the form of INSETT, the provision of which would be able to target increasingly more sophisticated development areas in science and mathematics education.

The above pre-supposes that there is a cadre of teacher trainers who are able to initiate change within teacher education and this should be seen as a priority area for intervention at the present time.

This would support the development of teacher competencies for science and maths.

RECOMMENDATIONS

- The review of teacher training curricula within the teacher training department of MoEYS.
- The development of teacher competencies for science and mathematics
- The development of application based pedagogical skills within teacher education curricula.
- The identification of a team of teacher trainers who can begin upgrading of knowledge to take into account new teaching methodologies.
- A concentration on the development and use of existing resources to support application based science.

## II Introduction

Education is neither, a formal or a continuous process. It starts in the home and it does not cease when formal education in school ends.

The purpose of schooling is to ensure that all children acquire a basic knowledge and a capacity to learn so that they can enter society as well rounded and qualified as possible. This aim is always present and cascades down through generations.

It can be noted that:

- The more successful the school, the more vibrant and successful is the community of which it forms an integral part and on which it depends. This concept of community is an integral part of the socio-economic base of Cambodia.
- The more successful the school, the more the quest for knowledge is likely to be pursued beyond its doors, after the last examination.

The success of schooling is critical to the successful future of Cambodia, it provides the future workforce and is the foundation for the economic development and the ultimate competitiveness of the country.

It is a means to increase productivity; adaptability to new technology; versatility in employment and in effecting a reduction in population growth with improved health and life expectancy.

This is particularly pertinent when considered form the perspective of girl's education.

The facts surrounding the recent history of Cambodia have been well documented in a number of key publications relating to the education sector.

*The A.D.B. Education Sector Strategy Study on Cambodia, 1996* states that the years from 1975 to 1979 saw:

> *The destruction of much of the institutional and physical infrastructure of the country and education. During this upheaval formal education was abandoned, books and equipment destroyed and teachers and students were sought and interned.*

Since 1979, the process of re-habilitation has begun with progress being rapidly made, particularly in the areas of Human Resource Development in Education.

Well-directed and focused investment in education is the key towards enabling the Royal Government of Cambodia to develop the country's educational capabilities. This will serve to increase access and to enhance educational opportunity which will raise the levels of independence of Cambodian citizens and will enable the skill development that is necessary to support the alleviation of the levels of poverty that so many Cambodian people find themselves in.

Focused and applied science education would further enhance this skill development, particularly as the increasing use in daily life of the products of science and technology underscores the need for a numerate and scientifically literate society.

The Government is committed to the provision of Science, Mathematics & Technology education for all primary and secondary students within the 12 year General Education requirement for schooling.

It is impossible to separate the realities of every day life from the scientific experience, whether in terms of making sense of everyday experience from a knowledge base or from applying scientific thinking to the situations in which an individual may find themselves.

85% of Cambodian society are involved in subsistence farming as their main livelihood and developments in agriculture serve to particularly illustrate the fundamental importance of the role of science within every Cambodian's educational experience.

A farmer already possesses a keen awareness of the need to increase crop yields to support the family and his/her behaviour and decisions are firmly rooted within a scientific context.

The study of biology supports the need for an understanding of the optimum conditions needed for plants to grow and an awareness of the consequences of changes made to these conditions, whether artificially or through environmental and physical changes.

Relevant science education will allow balanced and responsible decisions to be made regarding the ways in which the properties of chemicals can be used to support plant growth and in pest control. These decisions can be measured and rationalised against the potential harmful effects to the environment and ecological habitats that exist around the family home and land that is being farmed.

Crop rotation awareness will encourage the farmer to think about the land as a sustainable resource and to take steps to avoid depletion and to involve in patterns of long term planning.

The above utilises a discrete example to illustrate the extent to which science is embedded into the everyday life of a large group of the population.

In addition to these needs the Royal Government of Cambodia recognises that the burgeoning growth of any urban economy underscores the need for a large reservoir of numerate and scientifically literate students. This is important if the proportion of 'home grown' high quality engineers, designers and technicians is to be raised from its currently very low level.

## III Research Methodology

*The Aims of the Baseline Study*

- To provide the MoEYS with qualitative and quantitative Data to inform the development of a Science and Mathematics Master Plan

*The Objectives of the Baseline Study*

The Baseline Study was based around three main objectives:

- To provide up-to-date information to the Ministry on the situation of Science and Maths teaching from Grades 1 to 12.
- To provide information about the curriculum reform process and textbook production.
- To provide baseline competency information for teachers of science and mathematics to inform the development of curricula within Teacher Training.

The Baseline Study was conducted in May and June 1998 by the Programme Management & Monitoring Unit (PMMU) of the MoEYS.

Research methodology involved the following activities:

- Investigation of secondary material
- Government statistics
- Information from organisations involved in science and mathematics education.
- Published literature
- Direct field observations of science and mathematics lessons
- Semi-structured interviews
- *(Involving checklists of issues)*
- Group interviews

The research was carried out using mainly participatory research where the researcher collaborated with local people and organisations involved in Science and Maths education to explore the issues that it was felt required research and action.
RRA was chosen as a partial method of grassroots research to identify problems, goals & strategies related to the status of science education within Cambodia.
It is acknowledged that one problem with research led by outside people is the raising of local expectations where people may assume that basic research may inevitably lead to

money being spent in a locally developed programme. The researcher indicated during the pre-visit the limitations and restrictions in this respect.
The unit of analysis for focus was on three schools in Kandal Province that were representative of a Provincial approach to teaching & learning and on four schools in the Phnom Penh Municipality.
The sample schools were selected using random number tables applied to school lists provided by EMIS within the Planning Department of the MoEYS.
*(the names of individual schools involved in the study can be found in Appendix 1)*
The primary informants for the school visits were officials of the Provincial & District Education Offices (POE), school directors and science and mathematics teachers.
Start-up time was spent in:

- Review of appropriate documentation pertaining to science education
- Preparation of action plan
- Obtaining permission for school observation visits
- Preliminary meetings with Government organisations, NGO's and others involved in aspects of science education.
- Initial briefings with support staff regarding study objectives and utilisation of tools and instruments for carrying out the study.
- Obtaining initial statistics to support the report provided by Science & Maths survey carried out in 1995.

It was recognised through this study that it was necessary to represent all views, as success or failure of future development projects depends crucially on the attitudes and interests of people involved. This would also serve to eliminate areas of possible bias.
There was a need to provide a relatively quick response to the needs of this particular development-oriented project and a low cost approach to the rapid collection of information related to specific groups.
The researcher generally favoured a team approach to address any issues relating to bias of the researcher, generation of imaginative ideas and to marshal insight, however a counterpart was unavailable at the time of the study.

The initial findings were presented as a draft report in order to check validity and accuracy, allowing changes and comments to be incorporated from participants in the study.

*Limitations*

It is recognised that the limitations involved in conducting this study using the techniques identified were the possibilities of personal bias and the recognition that it would produce a static view.
The researcher recognised that, given the formality of approach and the perception of the researchers as representatives of the Ministry of Education, specific aspects of the study relating to school visits may have been contrived. Therefore the snap-shot gained may be less accurate than might have been the case had there been instruments built into the methodology to take this into account.

In order to achieve the Baseline Study objectives a number of resources for collecting data were developed.
The researcher attempted to use, where possible, instruments that were already utilised by the Ministry of Education, e.g.The Quality Indicators for lesson observation used by the SEIO. were used as a basis for the development of specific criteria to establish some baseline competencies in science and maths teaching.

*Semi-Structured Interview - P.O.E. officials*

The semi-structured interview with the officials of the P.O.E. was designed to ask specific questions about science and maths education in the schools in the Province.
The questions were asked from the perspective of the capacity of the P.O.E. to support teaching and learning in schools within the Province.
It also explored the relationship and communication with different aspects of MoEYS.

*Semi-structured interview - school director*

The researcher and a translator undertook this interview with the school director of the schools visited.
The translator and researcher met prior to the pre-visit and the main visit to discuss understanding and awareness of the questions that were to be asked and the type of information that would be requested at the time of the main visit.

The interview discussed attitudes surrounding the following issues.

- Whole school approaches to teaching & learning in science and maths.
- Information about the current practice and methodology used in the teaching of science and maths.
- Progress that has been made against specific short-term indicators identified at the June 1996 conference in science and Maths held at the MoEYS.
- Long term targets for the development of science and maths within the school and on the influences and constraints that may affect this development.
- Issues related to technological, Environmental and health education linked to science will be explored.
- Discussion of initial thoughts relating to the introduction of the new curriculum for science in Grades 7 - 9.
- Review of the progress in the distribution and use of the new science textbook in Grades 7 & 8
- Feedback on the progress of the construction of the tests for the year 9 & 12 examinations (25% school assessment)
- Resources available for use in teaching science and maths.
- . Rooms available for teaching science and maths.

*Group Discussion - Teachers*

The group discussion took place with a researcher and translator.
A list of questions provided a basis for discussion within the group.(Appendix 2)
These questions were designed to act as a prompt to provide open and honest discussion regarding the motivations and commitments of the teachers who were involved in teaching science & maths both within and outside the school.
The interview was intended to be confidential in as much as names would not be attributed to any one respondent when interpreting and presenting the data obtained.
The discussion attempted to elicit retrospective analysis of the levels of preparedness of the teachers upon entering teaching and a view of the appropriateness of the teacher training that was received.
It was envisaged that a discussion surrounding teaching methodologies used would take place, together with indications as to the perceived needs required from any future INSETT programmes.
The concept of child-centred teaching and learning will be explored in terms of teacher's perceptions and understanding of the needs and the strategies that may be developed to enhance this approach in science and maths.

*Lesson Observations*

In order to assess the level of teaching competence in science and maths lessons, the researcher undertook lesson observations across a variety of different grades.
The schools were given the opportunity to select the lessons where observation was to take place and the tools to be used for observation purposes were introduced at this time.
The Quality Indicators for Lessons (Appendix 3) which are currently used by the SEIO was utilised and these were distributed to the school at the time of the pre-visit in order that the school were able to prepare for the visit.
The intention of this advance notice was to enable the researcher the opportunity to observe the best lesson that the teachers were able to produce.
It was not the intention of the researcher to adopt a critical or corrective approach towards the lessons that were observed but rather to assess to what extent teachers had absorbed, assimilated and utilised whatever training they had received to date.
The researcher offered feedback to all teachers and directors, either separately or together as a result of the observations and offered a written report if agreed by the teacher.

*Focus for Observations*

Teaching does not rest on the application of one or two attributes, rather it is a complex phenomenon that takes into account a wide range of personal characteristics, professional skills and a specialised basis of knowledge.
In order to begin to assess the levels of teacher competence the foci for observation were determined by establishing baseline criteria for a competent teacher within an effective science and mathematics learning environment.

The main headings that were identified to provide this focus are listed below:

- Communication
- Planning & preparation
- Explanation & Demonstration
- Questioning
- Feedback
- Worktasks
- Classroom Management
- Motivating students to learn
- Assessment

Within each heading a checklist of questions were established in order to provide a more detailed focus for lesson observation to take place. (Appendix 4)

*Pre-Visit*

In order for schools to be prepared for the visit and to enable them time to collate documentation a pre-visit was arranged.

The purposes of the pre-visit were to establish a framework within which the main visit would take place, by:

- Developing a timetable for the main visit to the school
- Introducing the format for the semi-structured interview to the school director
- Introducing the school data information form to the director.
- Introducing the checklist of questions for the group discussion with teachers and explain its purpose.
- Allowing teachers the opportunity to see the lesson observation sheet that would be used to observe teaching & learning in science.
- Determining a timetable and level of feedback to the director resulting from the study.

*Visit*

Each visit took place over a morning.
The timetable involved time for lesson observations, interview time with the school director and time with the teachers of Science and Maths.
The visit also provided the opportunity to discuss with the school director the school data information sheet and to check that the required information had been understood and included.

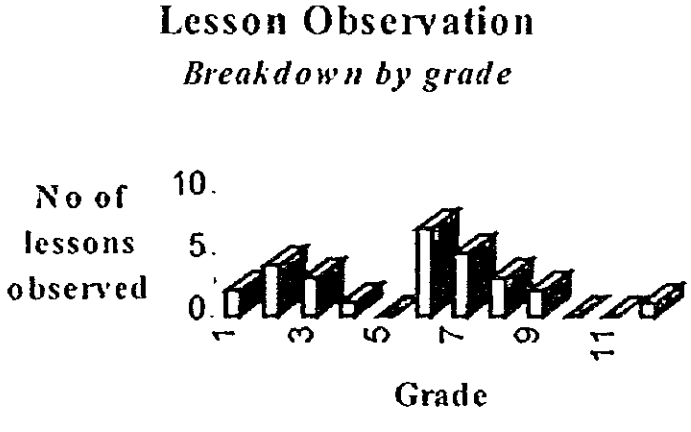
The interview with the Provincial Office official took place on the afternoon of one of the visits to schools.
The schedule for school visits can be found in Appendix 5.

*RESULTS & DISCUSSION*

The breakdown of lessons observed is shown in Table I

| Grade | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maths lessons observed | 2 | 3 | 2 | - | - | 3 | 2 | 2 | 1 | - | - | - |
| Science lessons observed | - | 1 | 1 | 1 | - | 4 | 3 | 1 | 1 | - | - | 1 |
| Total lessons observed | 2 | 4 | 3 | 1 | - | 7 | 5 | 3 | 2 | - | - | 1 |

*(Table I)*




The lessons that were selected by the school for the researcher to observe were all clustered around those grades where the new textbooks had been distributed and in which the teachers had received their T.O.P. (Textbook Orientation Programme ) including the introduction into child-centred teaching methodologies.(see Table I)

It may be anticipated that the school director felt more confident about the support offered by the textbook and teachers manual and felt that in those grades where this support was available the teaching and learning observed would be more successful.

The proposed impact study proposed by BETP will provide useful information to address whether this is the case in schools following the introduction of the new curriculum.

It is also possible that the director of the school anticipated that the researcher was particularly interested in those grades where the new curriculum had been introduced, however, this had not been stated as a specific requirement of the visit, although it was

indicated at the pre-visit that adjustment to the new curriculum was an area that would provide a focus during interviews with teachers and the school director.

The breakdown of lessons observed according to specialist subject shows an interesting pattern. (Table 2)

| Subject | Percentage Observed |
|---|---|
| Mathematics | 63 |
| Chemistry | 11 |
| Physics | 7 |
| Biology | 29 |

*(Table 2)*

Whilst the above table shows the breakdown of a limited number of lessons it can be seen that the majority of lessons observed were in Mathematics which represented 53% of the sample group and of this 53% primary school classrooms represented 36%.
This trend may be explained by comments from the teachers interviewed in primary schools who stated that:

- The school had taken the decision to concentrate on Khmer and Mathematics teaching and had been advised through their cluster meetings not to worry about teaching science.
- The teachers felt more competent teaching mathematics
- Khmer and Mathematics teaching took priority within the limited contact time available.

This lack of contact time was attributed by teachers to be due in part to:

- The large number of public holidays.
- the high rates of teacher absence due to commitments to a second job in order to supplement family income.
- The high rates of student absence dictated by farming cycles where help is needed on family farms and in part on the requirement, particularly for girls, to be available to look after younger siblings.

The survey on girls education carried out by MoEYS Department of Planning in collaboration with CARE International, July 1998 also attribute these factors to the high rates of repetition. It follows that if restricted access to the curriculum is a feature of the educational experience of children for whatever reason, failure rates leading to repetition will result.

- A final factor in one school observed was that during the rainy season the school campus is totally flooded, light is bad and therefore ther is no way that anything can be seen inside the classrooms.
  As a result on the day of the visit lessons could not take p-lace and the students had all left the school by 8.30am in the morning. It would be hard to estimate how much

contact time between student and teacher is lost in this way in schools throughout Cambodia.

The exciting exposure to a wide range of educational opportunity afforded by subjects such as science is being to denied to children and this will in turn affect their motivation to learn.
Children who come willingly to school will become more effective learners and if the education that is received is stimulating and varied, learning outcomes will be improved.

In Lower secondary schools the lessons observed were biology and chemistry and in Upper secondary there was one lesson of Biology at Grade 12 and the rest of the lessons were Physics.
Physics is notoriously one of the most difficult subjects within science to teach due to the high conceptual demands and the demand on resourcing.
The teachers observed had all studied at ther Unoversity of Phnom Penh and felt confident with the subject material that they were to teach because of this input.
Another possible explanation for the pre-dominance of Biology may be found in the relative proportions of instructional hours afforded to science and mathematics through Grades 7,8 & 9. (Table 3).

*Table to show relative proportions of instructional hours*

| SUBJECT | GRADE 7 | GRADE 8 | GRADE 9 | TOTAL | PERCENTAGE |
|---|---|---|---|---|---|
| Mathematics | 4 | 5 | 5 | 14 | 14.14 |
| Geology | 1 | 1 | 1 | 3 | 3.03 |
| Chemistry-Physics | 2 | 2 | 3 | 7 | 7.07 |
| Bilogy | 2 | 2 | 2 | 6 | 6.06 |

Table 3 *Source: Unofficial translation Lower School Curriculum*

Classroom observations focused on a total of 7 female teachers of whom 5 were mathematics teachers and 2 were biology.
The remaining observations were of male teachers with a breakdown of 10 maths teachers, 6 biology, 3 chemistry and 2 physics.

*Lesson Observations*

***The following discussions relate to data presented as graphs in Appendix 7***

*Communication*

In the lessons observed all teachers in Grades 1 & 2 attempted at least in part to utilise strategies that would encourage communication and dialogue between the teacher and the student and this communication at its most effective led to useful learning.
Proficient communication is essential for successful teaching and leads to the most useful learning.
The quality of teacher competencies in communication determines the level of student's learning and the interpersonal relationships that exist within the classroom and there is a need for the teachers of science and mathematicss to develop a range of communication skills if they are to maintain a purposeful learning environment.
The lesson observations showed that the quality of relationships was not something for which teachers employed deliberate strategies. 4% of teachers used first names when addressing students and 25% established eye contact regularly.
In some of the lessons observed the teachers were primarily concerned with the formal delivery of subject matter with the lesson at times resembling an extended monologue. There was little or no verbal interaction between the teacher and the student and questions were rarely asked.
Some teachers demonstrated an ability to listen to students views but the teachers in the lessons observed rarely encouraged students to express their own views about the subject matter being covered.
In some of the lessons observed the material was presented very quickly and the students had difficulty in keeping up with the pace of delivery. In at least two observations the speed of delivery suggested strongly that the teacher had a lack of knowledge about the subject content that was being taught.
In most of the lessons that were observed the teacher made little effort to vary tone, volume or emphasis and were therefore unable to transmit messages directly and forcefully to the students.
Science and Mathematics is a difficult subject when considered on a conceptual level and it is important for the teacher to emphasise key points and to employ repetition to emphasise these key points as the lesson progresses. 14% of teachers observed did recognise the importance of emphasis and used it effectively.
Repetition as a tool for reinforcing learning is one that was utilised strongly as a teaching and learning strategy and 89% of teachers utilised repetition in some way.

*Planning & Preparation*

Whilst most of the teachers observed in the study maintained high standards of written lesson planning these plans were largely based on an ideal and showed little awareness of the practicalities of the situation.
In many cases the expectations were well in advance of students abilities and activities that were planned were irrelevant or inaccessible to the students.
There was little awareness from discussions with teachers of how the achievement of learning objectives could be facilitated beyond the lesson plan itself, particularly given the physical and resourcing constraints present within Cambodian classrooms.

*Explanation & Demonstration*

These criteria originate from the premise that effective teachers provide quality demonstrations and explanations. The teachers observed attempted to provide support for students through the creative use of examples to help motivate students to learn and this use of appropriate examples provided an opportunity for students to link and integrate ideas.

The most effective teachers observed kept their demonstrations concise, clear and meaningful.

Some teachers whilst providing evidence of good record keeping and of grading and marking papers showed little willingness to provide good demonstrations that were meaningful and related to the subject matter being taught.

In many cases where teachers attempted to use demonstration the examples used were isolated activities and showed only a tenuous link to the subject content being taught.

Some teachers observed showed almost total dependency on the activities suggested in the teachers manual but when questioned closely had not assimilated for themselves the links between what was being taught and the activities suggested or examples used.

Many teachers showed a willingness to show use of resources during the course of the lesson observation however the examples used did not develop in a logical way and one example did not lead to the next.

In one lesson observed where the teacher was introducing units in maths, she asked students to choose for themselves what they wanted to use, e.g. straws or piles of paper were available.

The students developed mental maps of the columns representing units, tens, hundreds and thousands.

The teacher asked students to show each other how they represented numbers, which increased in complexity from 6 to 35 to 169 to 1284.

The students in this lesson had all absorbed what the teacher had wanted them to understand and although opportunities for students to become instructors for their peers and for individual ideas to be pursued were limited, the teacher had used her resources in an effective and meaningful way.

In another lesson on conduction of heat, the teacher had gone to a lot of effort to prepare an interesting and stimulating lesson with a variety of everyday resources to support her teaching, including candles, a pan of hot water and an iron.

She demonstrated to various students that heat could be felt and provided explanations related to the theory of conduction.

When the demonstration had finished the teacher was distracted by something that happened outside the classroom and left the room to investigate.

In the time between her leaving and returning students were 'feeling ' the heat from the objects left and playing with the lighted candles.

As is the case with most science at a basic level what students are exposed to is not different to experiences that they have on an everyday basis, however if we are to prepare them for further approaches utilising demonstrations and practical work, for example

using acids and alkalis we need to establish safe working practices and an awareness of the demands on the teacher when providing practical experiences in science.

### *Questioning*

In general a great deal of time is taken up in lessons on questioning students and in some lessons observed this approach tended to dominate above all others.-
Questioning is the means by which communication between the teacher and the student takes place and is an obvious way to establish whether learning is taking place however there was a tendency for teachers in all of the lessons observed to utilise only closed questions in order to elicit the correct answer.*

* *Closed questions – Questions are posed in such a way that a one-word answer is the usual outcome. Usually only one possible correct response.. Teacher has control over the outcomes.*
*Open questions – questions posed prompt a variety of outcomes. There is no correct answer. Teacher has little control over outcomes*

The lessons observed revealed that in general more questions were directed at boys than to girls (Table 4)

| Lesson Observation - *Questioning* | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gender | Mathematics | | | | | | | | | | | | | | | Biology | | | | | | | | Chemistry | | Physics | | Total |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | |
| Female | 3 | 2 | 3 | 3 | 5 | 3 | 4 | 3 | 1 | 2 | 2 | 4 | 3 | 3 | 0 | 1 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 3 | 1 | 0 | 0 | 53 |
| Male | 3 | 6 | 2 | 3 | 7 | 7 | 4 | 2 | 2 | 7 | 2 | 7 | 3 | 5 | 2 | 1 | 3 | 6 | 3 | 1 | 2 | 1 | 2 | 3 | 0 | 2 | 2 | 0 | 88 |
| Total | 6 | 8 | 5 | 6 | 12 | 10 | 8 | 5 | 3 | 9 | 4 | 11 | 6 | 8 | 2 | 2 | 4 | 6 | 5 | 3 | 2 | 1 | 2 | 5 | 3 | 3 | 2 | 0 | 141 |

*(Table 4)*

There was no effort made to use open questioning in order that a variety of different responses could be produced and for students ideas and thoughts to dominate discussions.
Questioning also serves to draw out facts or inferences from students and this can help the student to reflect on relevant concepts in subject matter.
Students in the lessons observed were very cautious about the quality of the answers that they gave and were concerned that they gave the correct answer.
Teachers can play an important role in encouraging an environment where student response is valued, whether it is right or wrong.
To restrict the opportunities for student response denies the teacher a mine of useful information that can be used for assessment purposes.
In many of the lessons observed the pattern of questioning style had become routine.
Some teachers consistently favoured the same students to answer questions, although it would be difficult to determine whether this was because the teacher was concerned that incorrect or slow answers would be taken to reflect poor teaching on their part or whether this was an established pattern of their classroom practice.

In one case where the student was having difficulty trying to express himself the teacher cut him off before had a chance to formulate his answer and invited other students to provide the correct answer. The students observed all stood when answering the teacher. The boy who had answered incorrectly was left standing for 5 minutes until a question was asked that he could answer. This situation may well serve to inhibit this particular student and may serve to alienate him and reduce his motivation to learn.
This concern with speed of answer was also a feature in the lessons observed.

*Worktasks*

All teachers attempted to demonstrate students working through group discussions although the way in which these were set up and developed showed a lack of depth in the awareness of the teachers as to the ways in which students working in this way can be facilitated.
Efficient science teachers will be able to provide appropriate tasks that stimulate student interest and consequently extend student knowledge and enhance learning.
Acquisition of skills and knowledge whilst important is only one part of a process in science teaching where there is a need to apply this knowledge to the solution of every day problems.
In one maths lesson observed the teacher not only introduced a wide variety of resources to support learning but also attempted to utilise games as a medium through which mathematical learning could be reinforced.
This form of focused student activity allowed the student to transfer their acquired knowledge within new and different contexts.
The teachers observed as part of the study showed a real commitment towards the provision of tasks so that students were more active participants in the lesson, however many of the tasks lacked meaningfulness and did not provide opportunities for students to practice a range of skills.
Although the teacher had initiated many of the tasks observed the amount of support provided was minimal and therefore many of the students found that it was easy to deviate from the task at hand.

*Motivation*

There is no one way to motivate students to learn and many of the strategies that teachers utilise are subtle and often indirect.
The ability to motivate students starts with an comprehensive knowledge of each student and what he/she responds best to and this is dependent upon maintaining the individual as the focus for teaching & learning.
There is also an element of parent, teacher and school expectancy in determining levels of motivation, i.e. extrinsic motivation resulting from an applied external force.
The other variable of course is the level of motivation of the student themselves – intrinsic motivation.

Goal orientation in terms of achievement in terms of examination success may also be a factor, positive and negative.
The skill for the teacher is to maintain and utilise these various factors in a positive way.
In the lessons observed there were some teachers who did not project enthusiasm and as such their presentation tended to lack stimulation.
Discussions with teachers in one school indicated that the lack of an appropriate salary was one factor which affected their approach towards their work, although in terms of their own motivation all teachers identified a commitment towards the strengthening of the educational base of the country and desire to share their knowledge with students as their key motivation.
Some of the students in the sample maintained that if not for parental pressure they would much rather stay at home!
Attendance at school however does not in itself represent an automatic achievement and learning and motivating students is a valuable tool in a science teacher's repertoire.

*Feedback*

In one maths lesson following a set task of answering pre-prepared examples that were written on the board the teacher read out the correct answers and moved on to new work.
There was no attempt to elicit whether everyone had understood and no individual student was provided with comment about his or her performance.
In most of the primary maths lessons observed the teacher would ask a question and ask the students to write down the answer on a slate.
Within a time limit a large ruler was banged on a desk as a signal for the students to hold up slates with their answers on. The teacher would spend no more than 30 seconds looking at slates and then proceed to the next question.
In one lesson, one boy consistently failed to write down the correct answer but was given no indication that he was working incorrectly.
When one of the observers went to help the boy, it became clear that there were others who had also not understood.
The teacher seeing this intervention returned to previous examples and provided an excellent explanation of the approach needed to solve the problem and 'walked' the whole class through the answers asking questions to ascertain whether learning was taking place.
Feedback in the lessons observed was never provided on an individual level and this failure to recognise the needs of the individual was a concurrent theme running throughout the lesson observations.
The teacher found little time to record information on the feedback that each student required and no indication existed of any kind of record keeping that related to the individual student.

*Assessment*

In the lessons observed it became clear that whilst there was a lack of conscious awareness regarding formative assessment strategies, conversations showed that the teachers were constantly in the process of collecting information about students performance.

When the teachers were asked why they did not record some of the information they replied that there seemed to be little purpose and if they did record this information how could it be used afterwards.

This is a matter of concern to the MoEYS and increased communication with parents or guardians has been set out as a strategy within the National Education Plan for 1998 – 1999. (National education Conference – $10^{th}$ – $12^{th}$ September 1998).

Teachers in the survey also collected data from students as a result of formal written tests which were set at irregular intervals and consisted of 10 questions which were then marked as one question representing one mark.

This information was often recorded in the teacher's workbook or on apiece of paper, however there was no use made of this information in terms of informing parents or informing future teaching.

When questioned about the situation where a student 'failed' a test the teacher responded that there would be no action.

In the scenario whereby a students was shown in these tests to be consistently failing, the teacher responded that he/she would discuss the case with the director of the school and that on occasion the students parents might be visited and any problems discussed.

The teacher responded that he/she would be unlikely to find the time to work with a student who was failing on an individual basis nor necessarily take any steps to establish why a student was failing.

It is sometimes the case that poor attendance might contribute towards a student who was consistently failing to achieve, however regardless of whether the student was achieving or not, there would be a recommendation that the student repeat the year based solely on attendance statistics and not on academic capability.

This lack of a meaningful use of assessment information, if the above scenario is representative of a general situation will contribute towards repetition rates in some schools.

In addition to this factor some students, who, although having passed their examinations would turn up at the beginning of the school year with younger siblings and as such would be found in a grade which was beneath their academic capabilities.

These factors are worthy of further investigation by interested parties involved in the problems posed by high repetition rates.

## V COMMENTARY