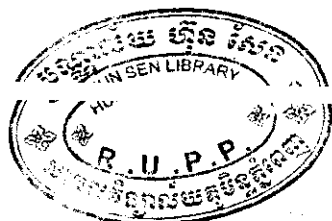# CAUSES OF POPULATION CHANGE

Module III

A Module for the Training of
Secondary School Teachers
in Population Education

Trial Edition

ERC K 000000009

UNFPA
United Nations
Population Fund

UNESCO
CAMBODIA

Population Education Project
CMB/95/PO6

Phnom Penh
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FOREWORD

Population education is a curriculum reform that has been introduced in 1996 in the secondary level of the formal education system of the Royal Government of Cambodia through the "Project: To Integrate Population Education in Formal Education System (Phase I) (CMB/95/PO6)." The project is funded by the United Nations Population Fund (UNFPA) and executed by United Nations Educational, Scientific and Cultural Organization (UNESCO). The implementing agency of Government is the Ministry of Education, Youth and Sports (MOEYS).

The modality for introducing population education in the school system is **integration** of population concepts/contents in related contents of the curricula and syllabi of Social Studies (Geography and Moral and Civics Education), Biology and Home Economics. It augurs well that this curriculum reform is timed with the textbook development master plan of the Ministry. The timing facilitates the permeation of population education contents during the development of textbooks and teachers guides for Grades 7 to 12.

In any curriculum reform, an innovation or a change for the better is only as good as the teachers who play a key role in influencing learners' attitudes and behaviour. It is what happens at school and in the classroom that makes a difference in changing knowledge, attitudes and behaviour of students.

Consequently, there is a need for training and retraining of teachers. The training of teachers in population education is undertaken by a team of trainers who are subject area team leaders, textbook/teachers guides writers and evaluators - all staff of the Research Institute, MOEYS.

The general objectives of the 6-day training for secondary school teachers are:

1.   To gain knowledge and understanding of the new textbooks and teachers guides in Social Studies and Home Economics.

2. To develop understanding and appreciation of the population education contents/topics integrated in the Social Studies and Home Economics textbooks and teachers guides.

3. To develop understanding and skills in the use of learner-centred teaching methodologies.

A Training Manual for the Training of Secondary School Teachers in Cambodia has been developed for use of the team of trainers who are in charge of training the teachers. A companion material of the **Training Manual** is a set of modules on population education for teachers. These modules aim to provide teachers with background information on population education to enable them to teach effectively the population education contents/topics that are integrated in the textbooks of Social Studies, Biology and Home Economics.

The lists of the modules are as follows:

I. Population Situation of Cambodia

II. Rationale, Goal and Objectives, and Contents of Population Education for Secondary Schools

III. Causes of Population Change

IV. World Population Growth

V. Population, Resources and Environment

VI. Physical Aspect of Adolescent Development

VII. Ovulation and Menstruation

VIII. Social Aspects of Adolescent Development

IX. Reproductive Health and Family Planning

X.   Sexually Transmitted Diseases, AIDS/HIV

XI.   Sex Roles and Gender Issues

XII. Selected Teaching Methodologies

These modules are intended primarily as resource materials for the training of teachers in either face-to-face training situation or in independent self-study (modular approach) programme without a trainers' facilitation.

The contents in population education covered by the set of twelve modules are not exhaustive. There are many more population issues that need to be addressed by instructional materials for trainers and teachers. These should be developed as the need arises. Thus, training is dynamic and responsive to emergent needs of teachers and trainers.

Hopefully, all training efforts should result in a commitment on the part of teachers to teach population education in Social Studies, Biology and Home Economics and to teach it effectively. Ultimately, population education should enable the youth to make rational and informed decisions regarding population-related issues and take actions on them **now**.

Table of Contents

Causes of Population Change

Introduction

This module will help you to understand population change. It also gives you the different factors and components of population change. These concepts are explained in this module. Trends of population growth are also discussed.

The charts, tables and graphs given in this module will help you to comprehend more clearly the concepts of population change and trends.

There is a set of exercises at the end of each lesson which you should answer.

This will serve as a practical resource guide to enable you to teach population education in Social Studies.

Specific Objectives

After studying this module, you should be able to:

1. Describe the population change in Cambodia.
2. Discuss the important components and factors which influence population change.
3. Discuss the effects of population change in the country.
4. Apply the skills of comparison, recall, observation, interpretation and evaluation.

Fertility

Population Change

Demography is the study of population. The term "population" relates to the number of people in a given area. As people are born, die or move, their total numbers in an area change. Population change is measured by the difference between population sizes at different dates. The population change is determined mainly by fertility (Births), mortality (deaths) and migration. We shall study each of these causes of population change.

Study the formula below:

Population = Birth - Death + In-migration - Out-migration

$P2 = P1 + (B - D) + (I - E)$, where
P2 is the population at the later date.
P1 is the population at the earlier date.
B is number of births and D is number of deaths between the two dates.
I is immigration (or in-migration) and E is the emigration (or out-migration).

For example, let us take Netherlands

14,812,800 = Population of the Netherlands Jan. 1989	14,715,000 Population of Netherlands Jan 1988	+ (186,600 - Births 1988	124,200) + Deaths 1988	(91200 - immigration 1988	55800) emigration 1988
During 1988 the population of the Netherlands increased by 97,800					

(Births - Deaths) is called Natural Increase (Figure 1).

Fertility refers to the actual reproductive performance of a population. Ever since the science of demography has been developed, fertility occupies a central position in it. The change and growth of population depends on fertility. It is the positive factor behind the expansion as well as the dynamics of population. Social, psychological, cultural and political factors are involved in determining difference of fertility. It is also noted that due to these factors large fluctuations occur in fertility rates. For example, legalized abortions lead to decline in birth rate.

Figure 1

The Contribution of Natural Increase and Net Migration to the Total Population
Increase in Selected OECD Countries Between 1 January 1980 and 1 January 1991[1]
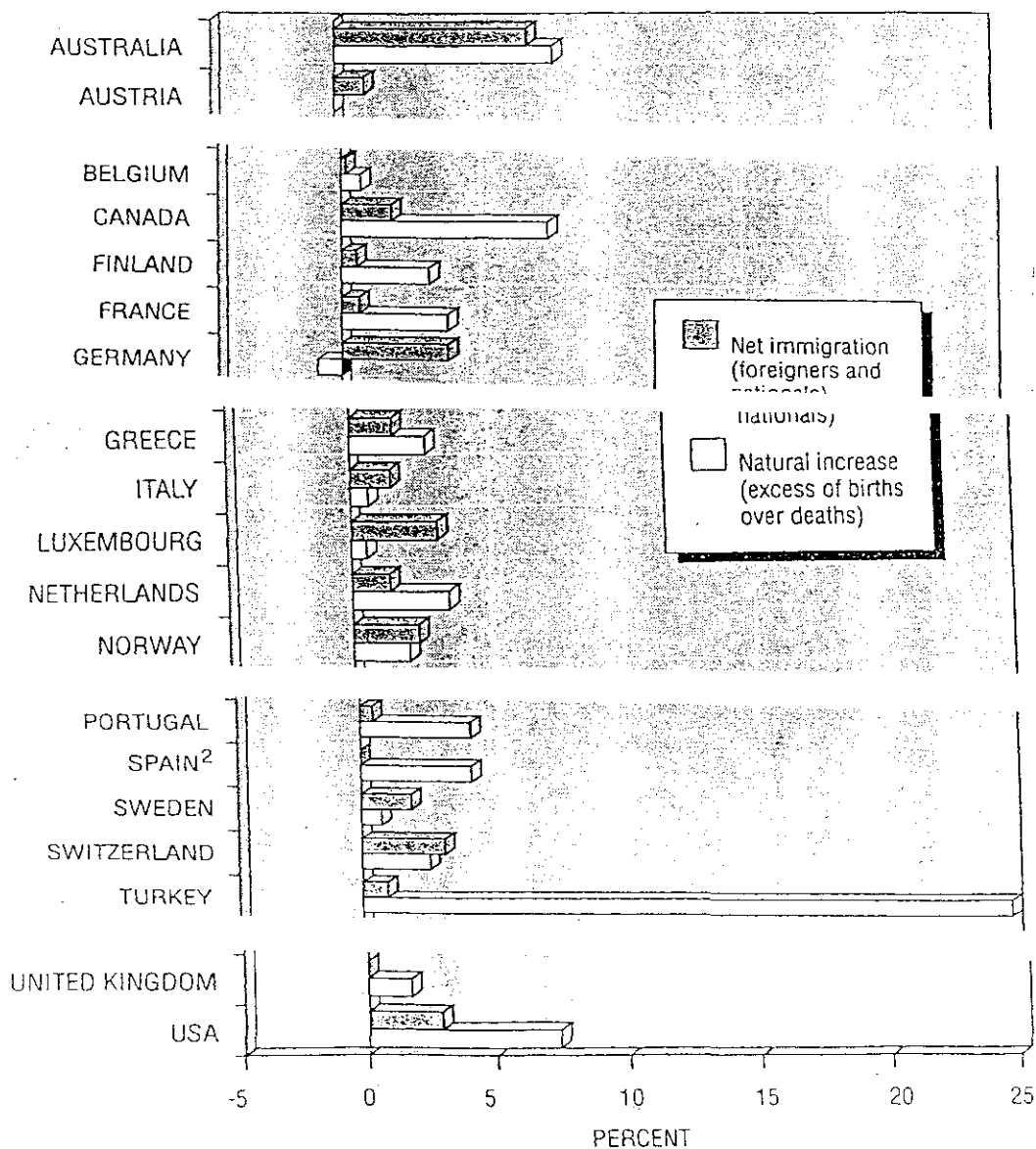
1. The population increase between 1980 and 1990 is calculated as a percentage of the
   population at the beginning of the period.
2. Between 1 January 1980 and 1 January 1989.
Source: OECD (1991) *Labour Force Statistics, 1980-1991*

Nature of Fertility

Fertility is basically biological and a natural factor of population change, though it is very much influenced by the social norms. Fertility is the number of live births occurring in a population. It is affected by fecundity (the biological capacity of a woman to reproduce), age at marriage, the availability and use of contraceptives, economic development, the status of women and the age structure. The crude birth rate is defined the number of live births per 1000 population in a given year. This is a measure of fertility.

Measures of Fertility

Let us study the three commonly used measures of fertility.

1. **Crude Birth Rate (CBR):** Means the number of live births per 1000 population in a year.

2. **Total Fertility Rate (TFR):** is the number of average live births per woman in the child bearing age (15-49) at the end of her reproductive life span.

3. **Age Specific Fertility Rate (ASFR):** is the number of live births to the women in a specific age group (e.g. 25-29 years) per 1000 females in that age-group at mid year.

The following table shows how to calculate the crude birth rate, which is the simplest measure of fertility:

Crude Birth Rate $= \dfrac{\text{Number of births in a year}}{\text{Total population}} \times 1000$
$\dfrac{27,300,000}{853,373,000} \times 1000 = 32.0$
There were 32 births per 1000 population in the year in X country.

A high level of fertility in Cambodia is seen since 1980. The crude birth rate has been very high in the past 15 years, at 43 per 1000 in 1993. This implies more than 350,000 births a year or about 1,000 births a day.

The present population of Cambodia may be called "young", because 47 percent of the population are children, who are less than 15 years old. The table follows presents the age-structure of Cambodia as estimated in 1993.

Percentage Distribution of Population of Cambodia by Broad Age Groups, 1993			
Age Groups	Males	Females	Total
0-4	9.6	9.4	19
5-14	14	14	28
15-64	23.3	26.7	50
65+	1.3	1.7	3
Total	48.1	51.9	100

Source NIS, Ministry of Planning

Social and economic variables such as education, employment, religion etc., affect fertility through their effect on immediate variables related to the physiology of reproduction - intercourse, conception and pregnancy outcome. (Marriage, abortion, or a live birth).

Education, too has its impact on fertility. Generally, the fertility rates for women in the urban areas are lower than that of those in the rural areas. Fertility of educated women is generally lower than the fertility of illiterate women.
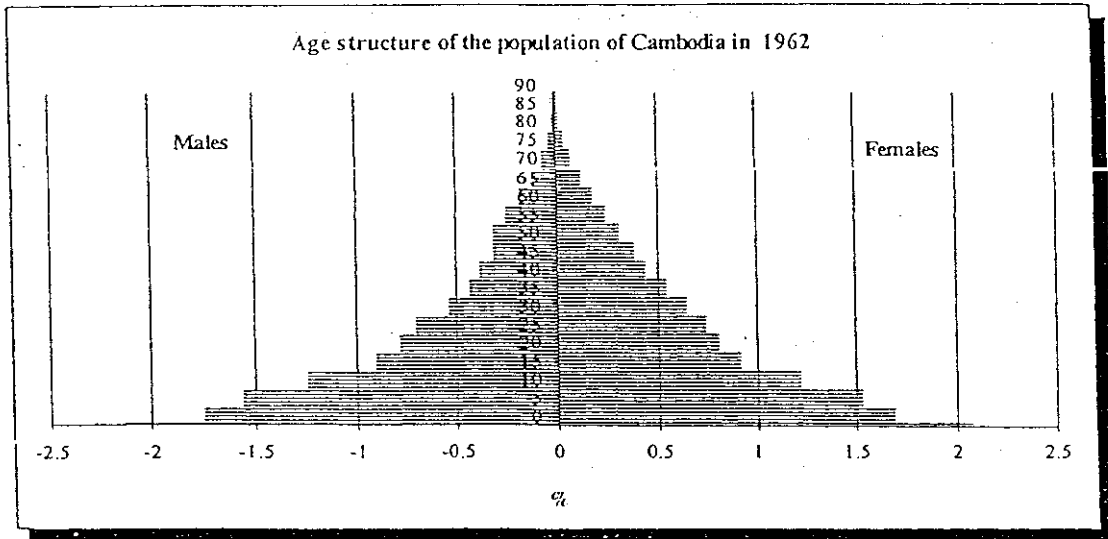
Effects of fertility

1. Population change: High Birth Rate combined with a declining death rate results in an increasing population.

2. Age structure: High Birth Rate interacting with a relatively low death rate results in a "young" population. On the other hand, low birth rate will result in an "old population".

   Examine Figure 2 and note that the bottom of the population pyramid is broad which refers to a large proportion of children in Cambodia.
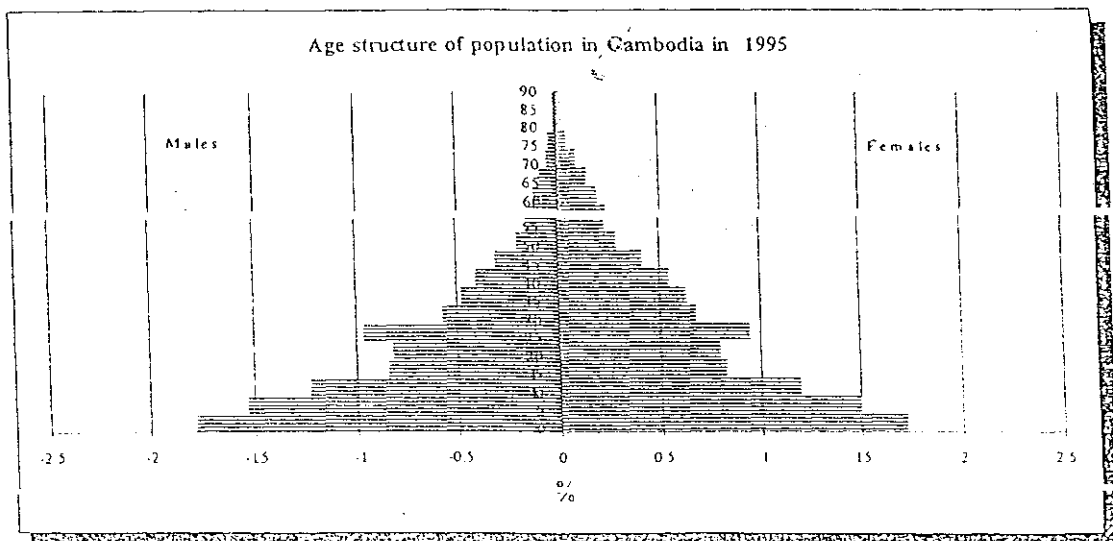
3. Burden of dependency. As a consequence of young age structure, there are many dependents. High fertility means, more children to provide in terms of basic needs such as food, clothing, shelter, health care, education etc. Fewer children in the family means greater attention and better family welfare.

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Comparison of Population Structures of 1962 and 1995

Graph 2

Age structure of the population of Cambodia in 1962

Males

Females

```
90
85
80
75
70
65
```

-2.5   -2   -1.5   -1   -0.5   0   0.5   1   1.5   2   2.5

%

Notes: The pyramid has been drawn from the adjusted data of the 1962 Census. The percentages of population are by single years of age.

Age structure of population in Cambodia in 1995

Males

Females

```
90
85
80
75
70
65
```

-2.5   -2   -1.5   -1   -0.5   0   0.5   1   1.5   2   2.5

%

Notes: The pyramid has been drawn from the data of the World Population Projections of the United Nations, 1994.

6

Exercise No. 1

Put a tick mark ☑ against the correct answer for the following questions.

I.   **1.**   **Fertility Means**

   a.   death   ☐

   b.   pregnancy   ☐
   c.   birth   ☐
   d.   movement   ☐

2.   **Fertility is**

   a.   natural factor   ☐

   b.   man made factor ☐
   c.   political factor ☐
   d.   economic factor ☐

3.   **Demography is**

   a.   study of society   ☐
   b.   study of economy   ☐
   c.   study of population ☐
   d.   study of geography   ☐

II.   **Filling in the blanks:** Choose the correct answers from the following: mortality, natural, biological, fertility, 43, 47, migration, reproductive, live births.

1.   Population change is determined by _____, _____ and _____.

2.   Fertility is basically _____ and _____ factor of population change.

3.   Fertility refers to the actual _____ performance of a population.

4.   Crude birth rate means the number of _____ per 1000 population.

5.   The crude birth rate in Cambodia is ____ per 1000 in 1993.

6.   In Cambodia ____ percent of the population is less than 15 years old.

III. **Matching Test:** Match the statements in column B with the terms in column A. Check your answers against the Key To Correction found in Appendix A.

Column A	Column B
1. Demography	a. Fertility, mortality and migration
2. Fertility	b. 43/1000
3. Fecundity	c. Actual reproductive performance
4. Population change	d. Biological capacity to have children
5. Cambodia's birth rate	f. Study of population

Mortality

What is mortality ? Mortality means death. Population change has been defined in terms of changes in fertility, mortality and migration. In this lesson, we will discuss some of the salient features of mortality. According to the United Nations, mortality is the percentage of deaths in the population. Death is permanent disappearance. Broadly speaking, death statistics are needed for purposes of demographic studies and for public administration. Death is measured by counting the number of deaths per 1000 population.

While we all eventually die, the probability of dying is linked to many factors, such as age, sex, race, occupation, and social class. The incidence of death can reveal much about population's standard of living and health care.

Death Rate

The death rate (also called the crude death rate) is the number of deaths per 1000 population.

Crude Death Rate =	$\dfrac{\text{Number of deaths} \times (1000)}{\text{Total population}}$
	$\dfrac{81\ 442 \times 1000}{18,940,000} = 4.3$
For example, in 1988 the death rate in X was 4.3 per 1,000 population.	

The above example will help you to understand the death rate of a particular country.

Like crude birth rates, crude death rates are affected by many population characteristics, particularly age structure. When comparing death rates between countries, we should see the country's health, economic or environmental conditions.

Age specific death rates: Death rates can be obtained for specific age groups in order to compare mortality at different ages or a change in mortality at the same age over time. Age specific death rate is an important measure of mortality in a country.

Infant mortality rate

The infant mortality rate is the number of death to infants under
one year of age per 1000 live births in a given year.

Example
$$\frac{\text{Number of deaths to infants under age one}}{\text{Total live births}} \times 1000 = \frac{6658}{343\ 692} \times 1000 = 19.4$$

There were 19 deaths to infants under age one per 1000 live births in X country
in 1988.

The infant mortality rate is considered a good indicator of the
health status of a given area.

Maternal Mortality Rate

This is also an indicator of the health status of a given area.

The maternal mortality rate is the number of women who die as
a result of child bearing in a given year per 100,000 births in that year.

Example

$$\frac{\text{Number of maternal deaths}}{\text{Total Live Births}} \times 100,000 = \frac{15 \times 100,000}{81,376} = 18.4$$

There were 18 maternal deaths per 100,000 live births in X country.

Life Expectancy at Birth: Life Expectancy means the average expectation of life. At birth, life expectancy is a good indicator of current health conditions. As mortality trends change, each person's life expectancy also changes as he or she grows older.

It should be noted that low life expectancies in developing countries are in due to a high infant mortality rate. The sex distribution and age structure are the important factors in life expectancy.

Mortality Trends

1. Crude death rate in the developing countries is higher that in the developed countries.

2. Infant mortality rates in developing countries are higher as compared to those in the developing countries.

3. The average life expectancy at birth for both male and female in the developing countries is lower than those in the developed countries.

4. Compared to the past, most of the countries are recording low death rates now.

Reduced death rate is particularly due to the elimination of epidemics and control of famines, food shortages and lack of sanitation.

Factors Affecting Mortality:

Rural-urban differential in death rate is due to the availability of medical facilities, educational facilities, age at marriage in the urban areas and their scarcity in the rural areas.

Socio-economic status has proved to be an important mortality differential in different countries. Mortality rates are generally higher at the lowest socio-economic level.

Population change is also affected by mortality rate.

Exercise No. 2

Put a tick mark ☑ against the correct answer for the following question.

I. **1.** **What is mortality ?**

a. birth ☐
b. death ☐
c. migration ☐
d. population change ☐

2. **Infant is**

a. under 5 years ☐
b. under 1 year ☐
c. under 15 year ☐
d. under one month ☐

3. **Maternal mortality is calculated for**

a. 100 live births ☐
b. 1000 live births ☐
c. 100,000 live births ☐
d. 10 live births ☐

II. **Filling the blanks:** Choose from the following possible answers: *1000, death, indicator, expectation, current health*

1. Mortality means _____.
2. Death is measured by counting the number of deaths per _____ population.
3. Infant mortality rate is a good _____ of the health status.
4. Life expectancy means the average _____ of life.
5. Life expectancy of birth is a good indicator of _____ condition.

III. **Match Test: Match the answers in Column B with the statements in Column A. Check your answers against the Key To Correction in Appendix A.**

Column A

1. Mortality
2. Infant
3. Maternal mortality
4. Life expectancy
5. Reduced death rate is due to

Column B

1. Elimination of epidemic and control of famines
2. Nothing but death
3. Is a good indicator for current health status
4. Is calculated for 100, 000 births
5. Is under 1 year

LESSON 3

Migration

Now let us analyze the third factor of the population change. What is migration ? Migration is the movement of population. More exactly, it is the movement of people across a specified boundary for the purpose of establishing a new residence. Along with fertility and mortality, migration is a component of population change.

Migration among human beings however, is not biological. This is a man-made factor, largely dependent on the human will. Now, we will see the importance of migration on population.

1. It decreases or increases the size and structure of any population.
2. It determines the size and the rate of population growth as well as its structure and characteristics.
3. It plays an important role in the distribution of the population of any country.
4. It determines the growth of labor in any area.
5. It is a symptom of basic social change in any country.

According to the Demographic Dictionary: Migration is a form of geographical mobility or spatial mobility between one geographical unit and another, generally involving a change in residence from place of destination to place of arrival.

Types of migration

1. Immigration and Emigration

These terms are used in the context of the international migration from one country to another country.

2. In-Migration and Out-Migration.

In-migration, refers to movement in a particular area. Out-migration, by the name, means movement out of a particular area. These terms are applicable to internal or within-the-country migration only as for example, the migration of rural people to urban areas in a country.

3. Gross and Net Migration

Gross migration is the volume of migration. Net migration is the difference between the total number of persons coming in and total number of persons moving out or, the difference between the total number of arrivals of immigrants and in-migrants and departures of emigrants and out-migrants.

These types are called internal migration and international migration.

Now, let us discuss the various factors of internal and international migration.

Internal Migration

Pull and push factors

This approach is situation-oriented. It attempts to study the factors which impel persons to move out from their place of origin. It also studies the conditions and situations that attract persons from outside to migrate. This is the traditional approach to the study of motivation of migrants. Comparative studies have been made to find out the relative importance of push and pull factors. Push factors are those which motivate going outside from the place of origin. These include high natural rate of population growth creating population pressure on the existing resources, draughts, floods, natural calamities, political conflicts etc. The pull factors, on the other hand, pull population from outside. These factors include establishment of new industries, provision of new opportunities, facilities of higher education, better climatic condition, marriage etc.

For example a number of attractive factors in urban areas is a very strong pull migration from rural to urban areas; security reasons push people out to safer areas.
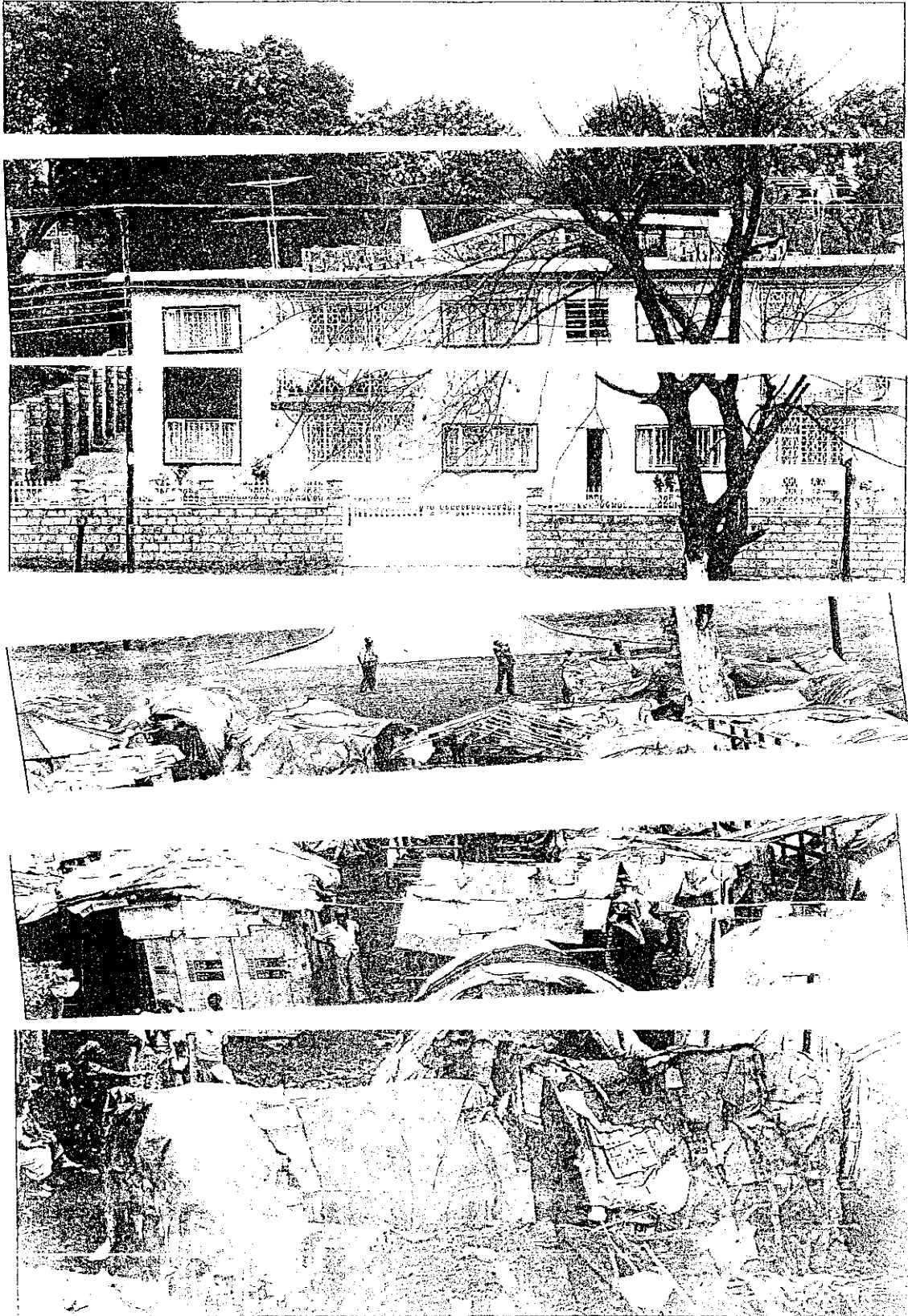
The scene above reminds you of Phnom Penh which attracts people from the countryside in search for a better life, but only to end up as squatters on public or private lands.

Patterns of Migration

There are four discernible patterns of migration.

1. Rural to urban
2. Urban to rural
3. Rural to rural
4. Urban to urban

Rural to urban. This is the most popular type of movement. The pull of job and educational opportunities in the cities and the push of food shortage, lack of educational, job opportunities, land shortage in the rural areas are some causes of rural-urban migration. Example: rural-urban migration movement is the cause of population change in Phnom Penh.

Seasonal migration takes place when cultivators or farmers move to cities and towns from villages for short-term employment during non-agricultural seasons.

Urban to rural. Normally, the percentage of urban-rural migration will be less when compared to rural-urban migration. Once settled in a city, chances of a person going back to his village are rare.

Rural to rural and urban to urban. These are other two patterns of migration, which take place on a smaller scale than rural migration.

Migration Differentials

Migration differentials exist as in the case of mortality and fertility. Migration differentials includes so many factors such as age, sex, marital status, educational attainment and occupation. These migration differentials have been studied by sociologists and demographers for various purposes. For example, more middle aged male migrants move from rural to urban for job.

Migration is selective and is a man-made factor. It depends on different attributes of persons. For example, migration from village to city is mostly undertaken by rural males. A study of migration differentials is, therefore, necessary to understand the factors determining migration.
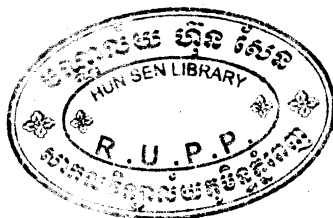
Characteristics of Migrants

Migrants tend to be a very selected group in many ways, both when compared with the population at origin and with that at destination. Only in the case of large-scale, forced moves- refugees - it is not true because then the whole population is involved.

Not all ages tend to move equally. There is usually a big peak among young adults, and few people move after age 45, though there is a small peak at retirement in developed countries. Young children move along with their parents.

Sometimes there is a substantial sex differential to migration, though often less than expected. Males tend to dominate in labor migration flows. The males move first and are later followed by the females. The unmarried tend to move than the married, as they are generally younger and have fewer roots. In many countries migration occurs after marriage when the wife joins the husband's household, or the husband joins wife's household or as a new household is formed.

Migrants tend also to be generally, better educated, richer and more ambitious than non-migrants, though some migration flows (both internal and international) are dominated by the poorest sections of the community, such as the landless or homeless.

Effect of both internal and international migration is the change in population size of the particular geographical area and country as a whole which affects the development of the country. Imbalances created by poverty, malnutrition, illiteracy and ill health, persist. The social tensions arising out of population pressure affect every aspect of life, impacting negatively upon its quality.

Population Change in Cambodia Due to Fertility, Mortality and Migration

Since 1970, the people of Cambodia have witnessed several wars, the regime of Democratic Kampuchea (DK) and the intervention of Vietnam. During 1975-79 population declined very much due to high mortality (1 million deaths), an exodus of population to the camps in the frontier and foreign countries (1 million), and decline in fertility (50%).

From 1980 onwards, there was a sharp increase in population, "due to a baby boom", decline in mortality and the return of 350,000 repatriates in 1993.

Uncontrolled movement of population to urban areas will require additional resources on the part of the place of destination. There will be need for more jobs, more housing facilities, increase in amenities such as power, fuel, water etc., more educational and health facilities, etc.

Exercise No. 3

I.   Put a tick mark ☑ against the correct answer for the following questions.

1.   **Migration is**

   a.   a movement of population   ☐
   b.   death   ☐
   c.   birth   ☐
   d.   biological factor   ☐

2.   **Immigration and emigration is movement**

   a.   beyond the country   ☐
   b.   within the country   ☐
   c.   rural to rural   ☐
   d.   urban to urban   ☐

3.   **Internal migration is movement**

   a.   beyond the country   ☐
   b.   within the country   ☐
   c.   of a biological factor   ☐
   d.   within the city or province   ☐

II. **Filling the blanks:** *Choose the answers from the following: possible answers:* movement, man-made, within the country, net migration, origin, destination.

1. Migration is a _____ factor.
2. Migration is the _____ from one place to another.
3. Internal migration is movement _____ .
4. _____ is the difference between the total number of persons (in-migrant) and total number of persons moving out (out-migrant).
5. Push factors motivate to move out of their place of _____. Pull factors attract population to the place of _____.

III. **Matching Test: Match the answers in Column B with the concepts in Column A.**

Column A	Column B
1. Migration	a. Movement outside the boundary
2. Internal migration	b. Is a pattern of migration
3. International migration	c. Within the boundary
4. Net migration	d. Man made factor
5. Pull and push factor	e. Difference between in migrant and out migrant

After you have completed the Exercise, check your answers against The Key To Correction found in Appendix A.

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Appendix A

Key To Correction

Exercise No. 1

I. 1.c. birth
    2.a. natural factor
    3.c. study of population

II. 1. fertility, mortality, migration
     2. biological, natural
     3. reproductive
     4. live births
     5. 43
     6. 47 percent

III. 1. Study of population (e)
      2. Actual reproductive performance (c)
      3. Biological capacity to have children (d)
      4. Fertility, mortality and migration (a)
      5. 43/1000 (b)

Exercise No. 2

I. 1. death (b)
    2. under 1 year (b)
    3. 100,000 live births (c)

II. 1. death
     2. 1000 population
     3. indicator
     4. expectation
     5. current health

III. 1. death (b)
      2. is under 1 year (e)
      3. is calculated for 100,000 births (d)
      4. is a good indicator for current health (c)
      5. elimination of epidemic and control of famines (a)

Exercise No. 3

I.   1.   a.   a movement of population
              a.   beyond the country
              b.   within the country

II.   1.   man-made
       2.   movement
       3.   within the country
       4.   net migration
       5.   origin, destination

III.   1.   man-made factor (d)
       2.   within the boundary (c)
       3.   movement outside the boundary (a)
       4.   different between in migration and out migration (e)
       5.   is a pattern of migration (b)

Appendix B

GLOSSARY OF TERMS

Population - refers to people living in an area in any given time.

Fertility - refers to birth. It is measured by the actual number of births.

Mortality - refers to death. It is measured by the actual number of deaths.

Migration - refers to the more or less permanent change of people from one geographic nit to another.

Internal Migration - refers to the movement of people from on geographic area to another within the country. For internal migration, the terms used are in - migration and out -migration.

International Migration - involves movement of persons across boundaries of countries; the movement is from one country to another on a permanent of semi-permanent basis. For international migration the terms used are emigration and immigration.

Crude Birth Rate (CBR) - is the number of births in one year per 1,000 mid-year population. It is the ratio of the number of births which occurs within a given population during a specified year to the size of that population at mid-year.

General Fertility Rate (GFR) - refers to the number of births that occur in a year per 1,000 women of childbearing age (15 - 49 years).

Total Reproductive Rate (TRR) - refers to completed family size or the number of children everborn (born alive) to a woman after completing her childbearing years (ages 15 to 49 years).

Crude Death Rate (CDR.) - is the number of deaths in one year per 1,000 mid-year population. It is the ratio of deaths which occur within a given population during a specified year to the size of that population at mid-year.

Gross Migration Rate (GMR) - is a measure of the total volume of migration or population year. (the formula for calculating gross migration rate is:

$$\text{Gross Migration Rate (GMR)} = \frac{\text{In-migrants} + \text{Out-migrants}}{\text{Mid-year Population}} \times 1000$$

Net Migration Rate (NMR) - is the net balance between the number of people who come to live in an area (arrivale) and the number of people who leave this area to live permanently in another geographic area (departures).

Net Migration = In-migrants - Out-migrants

Formula:

$$\text{Net Migration Rate (NMR)} = \frac{\text{Net Migration}}{\text{Mid-year Population}} \times 1000$$

Rate of Natural Increase (RNI) - is the difference between birth rate and death rate for a particular year. Rate of natural increase is expressed in per cent.

Formula:

Rate of Natural Increase (RNI) = Crude Birth Rate - Crude Death Rate

Doubling Time - is the time it takes a population to double in size. It is based on the same principle as the increase of money deposited at interest rate in a savings account in a bank. There is an easy way to calculate doubling time. It is a mathematical fact that, if a number is increased by 1 per cent each calculation, approximately 70 increases will double this number.

Therefore, a population growing at q percent per year takes about 70 years to double.

$$\text{Formula: Doubling time} = \frac{70}{\text{Growth Rate in Percent}}$$

Population Composition - refers to the distribution within a population of one or more individually carried traits or attributes. The individual characteristics generally includes age, sex, marital status, place of birth, education, occupation, labor force status, etc.

Age Structure - refers to the proportion of people contained within various age groups, such as the proportion of persons aged 0 -4 years, 5 -9 years, 10 - 14 years; etc.

Dependency Ratio: refers to the number of dependents every 100 persons in the productive years must support. This assumes that the age group 15 - 64 years constitutes the productive portion of the population and the young age group 0 - 14 and persons aged 65 years and over are the dependent portion of the population.

Formula:

$$\text{Dependency Ratio} = \frac{\text{Population 0-14 years} + \text{65 years \& above}}{\text{Population 15 to 64 years}} \times 1000$$

Population Pyramid - is the graphical representation of the age structure of the population. The vertical axis shows the age plotted on the graph in groups of years, usually in 5 with 0 at the base, and up to 80 and over. The horizontal axis shows the percentages of males plotted to the left and females to the right of the centre of the vertical line.

Sex Ratio - refers to the number of males per 100 females.

Population Density - refers to the concentration of population expressed in terms of number of persons per unit area.