



GRADE 11 GEOGRAPHY

UNIT MODULE 4

POPULATION STUDIES

- | | |
|---------------|--|
| 11.4.1 | Population Change |
| 11.4.2 | Population Trends in Papua New Guinea and the World |
| 11.4.3 | Socio – Economic Issues affect |



ACKNOWLEDGEMENT

We acknowledge the contributions of all Secondary Teachers who in one way or another have helped to develop this Course.

Our profound gratitude goes to the former Principal of FODE, Mr. Demas Tongogo for leading FODE team towards this great achievement. Special thanks to the Staff of the Social Science Department of FODE who played an active role in coordinating writing workshops, outsourcing lesson writing and editing processes, involving selected teachers of Central Province and NCD.

We also acknowledge the professional guidance provided by Curriculum and Development Assessment Division throughout the processes of writing, and the services given by member of the Social Science Review and Academic Committees.

The development of this book was Co-funded by GoPNG and World Bank.

DIANA TEIT AKIS

PRINCIPAL



Flexible Open and Distance Education
Papua New Guinea

Published in 2016

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Papua New Guinea

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ISBN: 978-9980-89-747-3

National Library Services of Papua New Guinea

Compiled and finalised by: Social Science Department-FODE

Printed by the Flexible, Open and Distance Education



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SECRETARY'S MESSAGE

Achieving a better future by individuals students, their families, communities or the nation as a whole, depends on the curriculum and the way it is delivered.

This course is part and parcel of the new reformed curriculum – the Outcome Base Education (OBE). Its learning outcomes are student centred and written in terms that allow them to be demonstrated, assessed and measured.

It maintains the rationale, goals, aims and principles of the National OBE Curriculum and identifies the knowledge, skills, attitudes and values that students should achieve.

This is a provision of Flexible, Open and Distance Education as an alternative pathway of formal education.

The Course promotes Papua New Guinea values and beliefs which are found in our constitution, Government policies and reports. It is developed in line with the National Education Plan (2005 – 2014) and addresses an increase in the number of school leavers which has been coupled with a limited access to secondary and higher educational institutions.

Flexible, Open and Distance Education is guided by the Department of Education's Mission which is fivefold;

- to facilitate and promote integral development of every individual
- to develop and encourage an education system which satisfies the requirements of Papua New Guinea and its people
- to establish, preserve, and improve standards of education throughout Papua New Guinea
- to make the benefits of such education available as widely as possible to all of the people
- to make education accessible to the physically, mentally and socially handicapped as well as to those who are educationally disadvantaged

The College is enhanced to provide alternative and comparable path ways for students and adults to complete their education, through one system, many path ways and same learning outcomes.

It is our vision that Papua New Guineans harness all appropriate and affordable technologies to pursue this program.

I commend all those teachers, curriculum writers and instructional designers, who have contributed so much in developing this course.

UKE KOMBRA, PhD
Secretary for Education



Dear Student,

Welcome to the Grade 11 Geography Course. This COURSE consists of four unit modules:

- UNIT MODULE 1 : THE STRUCTURE OF THE EARTH
- UNIT MODULE 2 : NATURAL PROCESS AND DISASTERS
- UNIT MODULE 3 : OCEANOGRAPHY
- UNIT MODULE 4 : POPULATION STUDIES

The Grade 11 Geography Course aims to introduce the science of Geography to students in Grade 11. It has been designed using learning outcomes that identify the knowledge, skills, attitude and values that all students achieve or demonstrate by the end of Grade 11. Grade 11 Geography course comprises of four modules.

11.1 : STRUCTURE OF THE EARTH

11.2 : NATURAL PROCESS AND DISASTERS

11.3 : OCEANOGRAPHY

11.4 : POPULATION STUDIES

11.1 Structure of the Earth, students will cover topics on forces and process that shape the landforms on the earth's surface.

11.2 Natural Process and Disasters will cover topics in Physical Geography at the Upper Secondary Level and will focus on Climate and the process associated with it.

11.3 Oceanography will introduce students to identify and describe the major oceans of the world with their ecosystems and how they influence climate.

11.4 Population Studies will help students understand the factors that influence population growth and change and its impacts on resource use and the environment.

The grade Eleven Geography course modules is focused on introducing to students Geography as a specialized subject. These modules aim to develop students' awareness of the natural environment and its processes and the interaction that exist between the natural and human environment.

Assessments

- **Activities**
Each Unit Module has activities for you to do. Answers to the activities will be found at the end of each Unit after the Unit Summary
- **Assignments**
Each Unit has an Assignment which you will do and then send to FODE Provincial Center for marking. The marked Assignment will be returned to you with comments and advice from your tutor. A mark will be given which will be counted towards your final internal mark.
- **Examinations**
After the completion of the course, you will sit for an internal exam which will make up 70 % of your total internal mark. You will now be ready for continuing in to Grade 12

For more information refer to the **Study Guide**.



Below are the steps to guide you in your course study.

- Step 1: Carefully read through each module. In most cases, reading through a lesson once is not enough. It helps to read something over several times until you understand it.
- Step 2: There is an instruction below each activity that tells you to check your answers. Turn to the marking guide found at the end of each module and mark your own written answers against those listed under the **Answers to Activities**. Do each activity and mark your answers before moving on to the next part of the module.
- Step 3: After reading the summary of the unit module, start doing the Learning Activities. Refer to the module notes. You must do only one practice exercise at a time.
- Step 4: Below each Learning activity, there is an instruction that says:

CHECK YOUR WORK. ANSWERS ARE AT THE END OF COURSE MODULE.

- Turn to the marking guide at the end of the Module Unit and mark your own written answers against those listed under the Answers to Learning Activity.
- Step 5: When you have completed a practice exercise and marked your answers, go back to the module and correct any mistakes you may have made before moving on to the next module.
- Step 6: Study the entire module following Steps 1, 2, 3, 4 and 5.

Here is a sample Study Timetable for you to use as a guide. Refer to it as a reminder of your study times.

TIME	MON	TUE	WED	THU	FRI
8:00-10:00	F O D E S T U D Y				
10:00-11:00					
1:00-2:00					
2:00-4:00					
6:00-7:00					
7:00-9:00	Listen to or watch current affairs programmes. Write your diary or read a book.				

A timetable will help you to remember when you should be doing your FODE studies each day.



UNIT · MODULE 11. 4: POPULATION STUDIES

Introduction:

In this book you will learn about the world population its size, composition, structure, distribution and migration of this population and the effects it has on the environment. You will learn about the factors that cause rapid increase and change in this population. You will also learn about what governments and people are doing to solve this problem of rapid population growth and the overuse of resources and the eventual destruction of the environment to cater for the needs of people.

Many difficult questions about the rapid increase in population and the increasing use and abuse of resources will also be asked. Different people will have different answers to these questions. Some answers will be good while some will be bad. You as a student will make your own decision and judgements about this population after you have thoroughly read through this book.



Objectives or aims

On successful completion of this module, students will be able to:

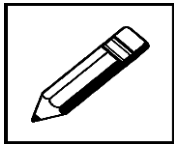
- Define and thoroughly understand the definition of population studies and demography.
- Identify and understand the prime factors that cause population growth and change. The three important factors are birth, death and migration.
- Understand the structure, composition, size and physical distribution of this population on the earth's surface and then make comparisons between developing and developed nations
- Understand and explain the effects of population growth on the economic, social and natural environments and the effects of external forces like disease, plagues, wars and natural disasters on the human population.
- Identify and investigate resource management and environmental issues associated with population growth throughout the world and in Papua New Guinea.
- Demonstrate a thorough understanding of key geographical concepts associated with population studies.
- Choose and apply a range of geographical skills associated with population studies and effectively use them to communicate information about the rapid population growth using appropriate written, oral, cartographic and other graphic forms of information systems available.
- Differentiate and make comparisons of the population size, structure, and composition between developing and developed nations.



Time Frame

This unit should be completed within 10 weeks. This is one term

If you set an average of 3 hours per day, you should be able to complete the unit comfortably by the end of the assigned week. (10 weeks)



Learning Activity

Try to do all the learning activities and compare your answers with the ones provided at the end of the unit. If you do not get a particular exercise right in the first attempt, you should not get discouraged but instead, go back and attempt it again. If you still do not get it right after several attempts then you should seek help from your friend or even your tutor. Do not pass any question without solving it first.

**TOPIC 11.4.1****POPULATION CHANGE****Introduction**

In this topic you will learn all about population change and the factors that cause it to grow rapidly from the beginning of human civilization up until the present time. You will also learn about population distribution and density and their representation on dot and choropleth maps and discuss the advantages and disadvantages of high and low population distribution as shown by density.

**Objectives or aims**

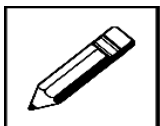
On successful completion of this topic students will be able to

- Explain and analyses factors influencing the population change and its effects on the environment.
- Demonstrate an understanding of key geographical concepts and ideas used in the study of demography and population studies.
- Choose and apply a range of geographical skills and techniques widely used in the study of demography and population studies.
- Interpret, compare and examine population statistics, pyramid graphs and tables.
- Compare world population growth by regions and /or countries.
- Examine and discuss the socio-economic conditions affecting population growth and distribution.

**Time Frame**

This topic should be completed within two weeks.

If you set an average of 3 hours per day, you should be able to complete the unit comfortably by the end of the assigned week.

**Learning Activity**

Try to do all the learning activities and compare your answers with the ones provided at the end of the unit. If you do not get a particular exercise right in the first attempt, you should not get discouraged but instead, go back and attempt it again. If you still do not get it right after several attempts then you should seek help from your friend or even your tutor. Do not pass any question without solving it first.



11.4.1.1: GLOBAL POPULATION and DISTRIBUTION

What is population?

Population is the number of people in a given area at any one particular time. It shapes everything about our world, from economic opportunities to environmental change to the experience of daily life. Understanding long-term trends is critical to making projections needed for intelligent economic, environmental, and health-care planning.

It is also important to understand that while many different societies have experienced similar long-term changes in population patterns, their experiences may vary greatly. The cultural preferences, economic incentives, and government policies that produce population changes display some similarities, but they cannot be reduced to a formula or generalization.

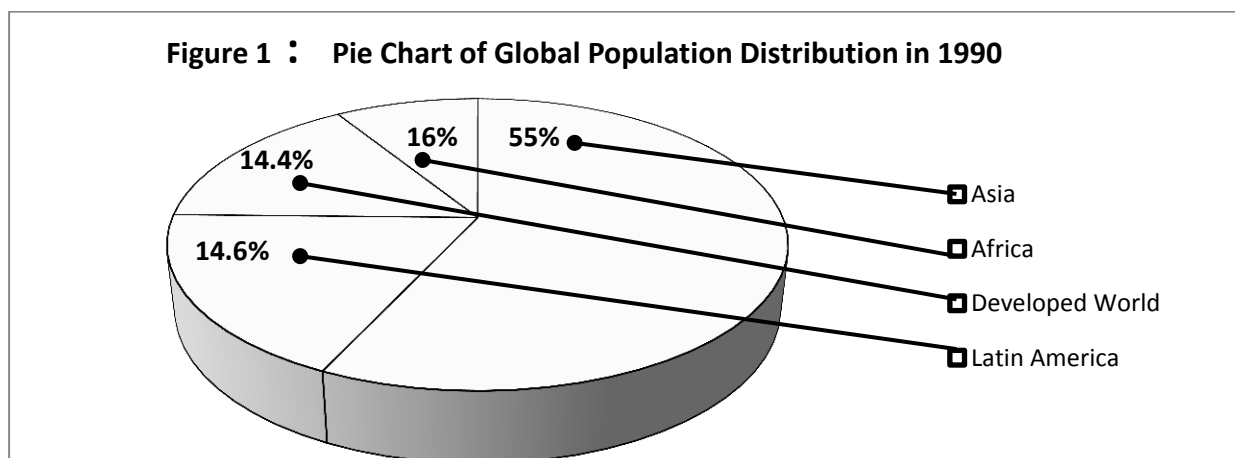
Global Population.

Today the world total population is well over 7 billion people. It has been accurately predicted that in the next century the population will increase by between eight and fourteen billion people depending on how birth rates can be reduced to replacement levels. The world's population has in recent times been described as a “**demographic time bomb**” because of its rapid increase. This rapidly increasing world population is distributed and scattered unevenly on the earth's surface. This uneven distribution and density of the human population is influenced by physical and social factors.

Distribution verses Density

Population Distribution:

Human beings are capable of living almost anywhere on this planet. They can live in the deserts, the Polar Regions and in the rainforest. Where humans prefer to live and do business is influenced by other external factors. The relative spread of the human population on the surface of this earth is referred to as global population distribution.



Sources: *Complete Geography: 1990*



Global Population Distribution

As of the year 2000, 1.2 billion people lived in the developed nations of the world, and 4.9 billion people lived in less-developed countries. By region, over half the world's population lived in East and South Asia; China with 1.3 billion inhabitants and India with some 1 billion were the dominant contributors. Europe and the other countries of the former USSR contained 14 percent, North and South America made up 14 percent, Africa had 13 percent, and the Pacific Islands had about 1 percent of the world population.

The highest concentrations of the world's total population are distributed in:

- China including South East Asia
- Subcontinent of India
- Continent of Europe

Areas of high concentration are identified in:

- Parts of North and South America
- Parts of Africa/ Europe
- Middle East/ Oceania

Sparsely distributed areas include:

- Parts of North America/ South America
- Australia/Russia

Most of the world's population distribution is concentrated in the continents of Europe, South East Asia and Americas. Oceania which includes Australia has virtually two-thirds of its land mass empty because of its vast desert environment.

The ten largest countries in the world by land area are Canada, China, USA, U.S.S.R (Russia) Brazil, Australia India, Argentina, Sudan and Algeria and the ten most populated countries in the world are China, India, U.S.S.R, USA, Indonesia, Japan, Brazil, Bangladesh, Pakistan and Nigeria.

Figure 2: Ten most densely populated countries in the world

	Country	Capital	Total Population (2008 estimate)	Total Land Mass (Square Kilometres)
1	Indonesia	Jakarta	238,000,000	190,000
2	China	Beijing	1,330,000,000	9,570,0000
3	United State of America	Washington DC	303,825,000	9,827,000
4	Russia	Moscow	141,000,000	17,100,000
5	Brazil	Brasilia	192,000,000	8,550,000
6	Pakistan	Islamabad	168,000,000	796,000
7	India	New Delhi	1,150,000,000	3,170,000
8	Bangladesh	Dhaka	154,000,000	148,000
9	Nigeria	Abuja	138,000,000	923,768
10	Japan	Tokyo	127,000,000	378,000

Sources: *World Atlas of Geography*

Population can also be concentrated along mineral deposits and resource development sites and along major transport networks and routes to have easy access to employment and business opportunities. This is for financial gain and a population may choose such location irrespective of its physical conditions. Religion and political forces have also influenced the development of population in other areas. Siberia and Australia are examples of settlements influenced by politics and religion. These factors combined contribute to the uneven distribution of the world population.

Dot Maps

A dot map is also called a thematic map. It is used to show the distribution or relative spread of the human population. One single dot represents a certain number of individuals that live in that area. For example if the actual population of Canada was fifty million people and is represented by five thousand dots scattered across its landmass then this simply means that one dot represent 10,000 people.

Figure 3: Dot map showing World's population distribution in 1990.



Sources: *Complete Geography: 1990*

Population Density

Population density is the measure of the number of people living within a defined area of land at any one particular time. It is usually expressed as persons per square kilometre. The formula to calculating population density is given below.

$$\text{Population Density} = \frac{\text{Number of people in that country}}{\text{Size of that Country (Square kilometres)}}$$



In any given area where more people live very close together from one end to the other then this country is said to be **densely populated**. Population can grow to such a large size that space and other basic items like food, water and other resources to support it become scarce and insufficient. Examples of such countries with very high population densities are Monaco, Nigeria, India and Indonesia.

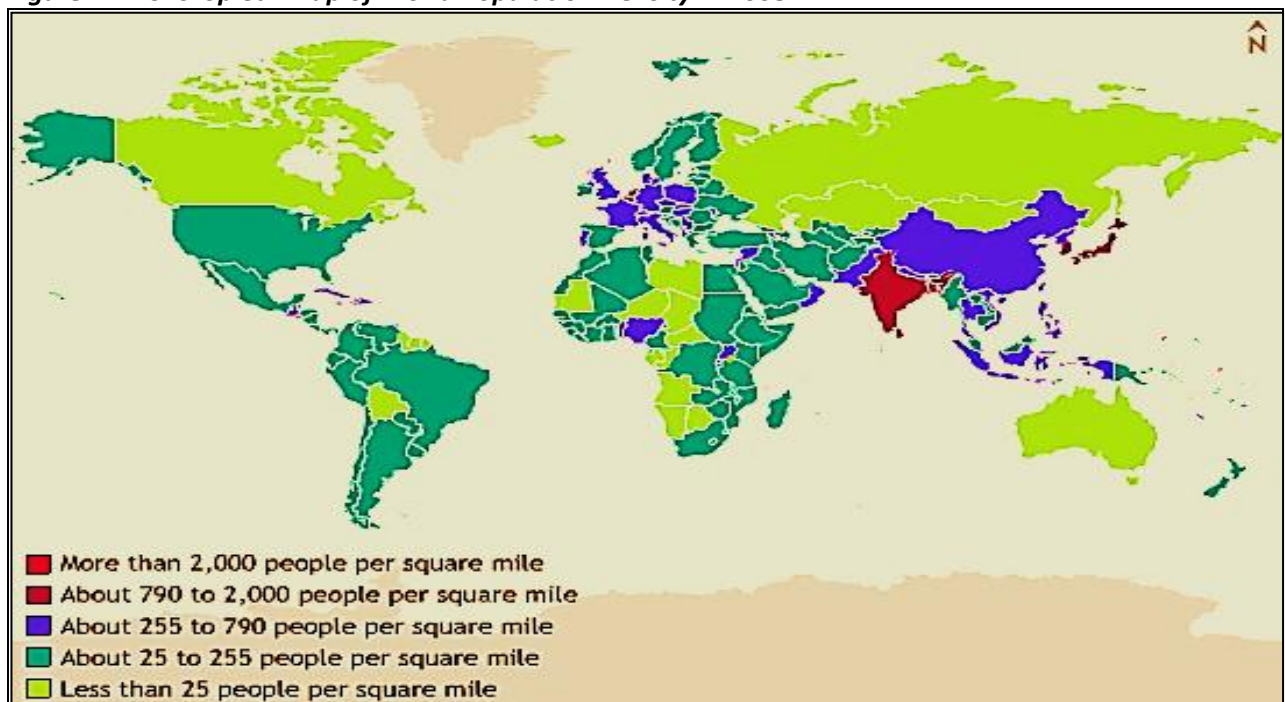
An area where its people are living far apart across its landmass is said to be **sparsely populated**. Its people have access to more space and other basic resources like food, water and other necessities for life. Examples of such countries sparse population densities are Russia, Australia and Canada

In **moderately populated** countries the ratio of total landmass to the total population is roughly equal. People have access to space and other scarce and vital resources at a moderate and sufficient level. Moderately populated areas can quickly turn in to densely populated areas if the population growth is not carefully monitored and brought under control. Such countries with moderate population densities are Norway, Finland and New Zealand.

Choropleth Maps

Population density of a country or area can be graphically represented using choropleth maps. These maps can be used to show both local and global population density. Different colours are used to indicate the level of population density in each country from sparsely populated areas to very densely populated areas. The choropleth map below shows the distribution of world population density in the year 2008.

Figure 4: Choropleth map of World Population Density in 2008



Sources Encarta 1990



Comparing advantages and disadvantages

Fast increasing population combined with a generally low level of economic activity can cause severe problems in highly distributed and densely populated areas. First, it poses a threat to the earth's resources. Vital resources such as farmland, fresh water supplies, fossil fuel reserves and mineral reserves can get depleted at a very fast rate as a result of increasing demand from a growing population concentrated and distributed in that area. For example in developed and industrialized nations all the population is concentrated in large cities and towns. To cater for the needs of this population a lot of resources have to be used resulting in the depletion of resources very quickly.

The United State of America is one country that has most of its population concentrated in urban areas and consumes more resources than any other country in the world today. In a developing country like Papua New Guinea the population is scattered and thinly spread. People conservatively use fewer resources in their daily subsistence way of life.

Deadly disease can quickly spread among the human population. In densely populated areas these diseases can spread very fast and become an epidemic if not contained early. Today HIV/AIDS, Ebola, Cholera, Tuberculosis, to name a few are fast spreading among densely populated areas in the world and have recently been declared as global epidemics. Overcrowding, lack of hygiene and lack of basic services all contribute to the spread of these diseases.

However, in areas where the population is thinly spread and distributed disease and pestilence do not spread very easily and a much persisting demand for the use of resources narrowly exist.

On the other hand in densely populated and distributed areas, the government will have easy access to collecting vital population data so that it can plan for effective service delivery to the people. Schools, hospitals, road and transportation networks, water supply and electricity and other basic services can easily be planned and delivered to the people. The people development needs can easily be identified and served. This is a common trend that works very well in developed and industrialized nations where the population are mainly concentrated and distributed in urban areas.

Developing countries have high population density that mainly dwell on subsistence way of livelihood in rural areas. The population are scattered and thinly distributed therefore applying population data collection methods like population census can become very expensive and difficult. For example in Papua New Guinea where the population is scattered across the country it had cost the government so much money and resources to conduct the first nationwide **population census** in 1990. A lot of money was used to mobilize transportation, equipment and labor from one part of the country to the other.



-
4. Discuss the difference between a Choropleth map and a Dot map.

5. Describe the conditions in which a disease can quickly spread and become an epidemic.

6. Describe what will happen to the natural environment and resources in an area where the human population is densely distributed.

CHECK YOUR ANSWERS AT THE END OF UNIT SUMMARY



11. 4. 1.2. Variation In Global Population Distribution

Variation in global Population Distribution

The way in which people are dispersed or spread out over an area is referred to as population distribution. The world's population is unevenly distributed. This is due to vast tracks of land being too cold, too dry or too rugged and mountainous to support more than a few people. In these harsh environments the human population is sparsely distributed. On the other hand in parts of the world where just around 10% of the total land surface is fertile and in industrial zones people are crowded together and densely distributed.

In economically developed nations like Australia, USA, England and Germany, the population is densely distributed and spread in the urban areas while in developing and poor countries like Papua New Guinea, Venezuela and Cambodia, the population is moderately distributed and scattered across the rural areas.

Factors of Uneven Distribution

The uneven distribution of the global human population is caused by both physical and human factors. The main physical factors can be listed as:

- a) accessibility
- b) relief and soil fertility
- c) climate and weather
- d) natural vegetation and animal life
- e) water supplies
- f) mineral and energy resources

Non-physical factors can be viewed as secondary location considerations and can be listed as:

- a) economic preference
- b) culture and tradition
- c) religion and social belief
- d) political forces

Since food is important for human survival two thirds of the world population still find their livelihood in farming or agriculture. Where agriculture is impossible or difficult, the area is sparsely settled. These include areas of mountain relief with poor soils and harsh climates of too cold, too wet and too dry.

On the other hand, fertile low-lying river valleys in tropical and temperate areas are well and densely populated due to intensive farming. For example in the highlands of Papua New Guinea the population is concentrated along the Whagi Valley where the river valley is very fertile and attracts intensive agricultural activities.

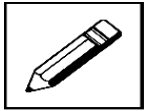


The table below, (*figure 5*) summaries the relationship between the different factors affecting global population distribution.

Figure 5: Summary Table: Factors Influencing Population Distribution.

	FACTORS	SPARSELY POPULATED AREAS	MODERATELY POPULATED AREAS	DENSELY POPULATED AREAS
1	Climate	Receiving very low rainfall Very hot / cold temperature eg: Sahara, Greenland	Receiving moderate rain Moderate temperatures E.g.: Central Australia	High rainfall all year round. Average temperatures all year.
2	Relief/Soil Fertility	Soils infertile, rugged and unsuitable	Soils only suitable for certain crops	Very fertile plains and valleys
3	Vegetation/ animal life	Very few species of plant and animal species	Few services and transport links	Abundant plant and animal life
4	accessibility	Transport network not connected. Isolated and cut off from basic services.	Have access to few transport routes	Effective transport network connected
5	Water supply	No clean water supply	Scarcity of clean water supply	Controlled water supply distributed to population
6	Energy resources	No electricity or sources of power	Few places connected to electricity	Access to electricity and other power supply
7	Mineral resources	Several mining activities	few mining activities	Agricultural activities and less mining activities.
8	Economic preference	Economic activity non-existent	Few scattered economic activities	Concentration of economic and industrial activities
9	Culture & tradition	one culture and ethnic groups e.g.: Muslims	Defined cultural and ethnic groups	Multi-culture and religions exist
10	Religion & Social belief	One religion : eg Muslims, Christians etc.	Two or three different faiths exist.	Existence of many different churches and faiths/ denominations

Source: Complete Geography.



Student Learning Activity 2

1. Complete the table below (Factors influencing population distribution)

	FACTORS	SPARSELY POPULATED AREAS	MODERATELY POPULATED AREAS	DENSELY POPULATED AREAS
1	Climate		Receiving moderate rain Moderate temperatures E.g.: Central Australia	
2		Soils infertile, rugged and unsuitable		Very fertile plains and valleys
3	Vegetation/ animal life		Few services and transport links	
4		Transport network not connected. Isolated and cut off from basic services.	Have access to few transport routes	
5	Water supply			Controlled water supply distributed to population
6		No electricity or sources of power		
7	Mineral resources		few mining activities	

CHECK YOUR ANSWERS AT THE END OF UNIT SUMMARY.



11.4.1.3: Birth Rates, Death Rates and Natural Increase

Vital statistics about population fall into two categories: **crude rates** and **refined rates**.

Crude rates are vital statistics about the general population, such as the number of births and deaths per 1000 people in a given population. **Refined rates** are vital statistics about a specific segment of the population, such as the number of births and deaths per 1000 people in a particular age group, ethnic group, gender, or state population. It is also equally important to understand that population growth, its relative spread and density are influenced and controlled by the interplay of three important factors of birth rate, death rate and migration.

Birth Rate is the total number of babies born into a population of 1000 every year.

For example Nigeria is a very densely populated country in Africa and in 1980 there were fifty five live births for every 1000 people (55/1000) in the country . That means in 1980 Nigeria had a birth rate of 55/1000.

Death Rate is the number of deaths in a population of 1000 every year. Again in 1980 there were twenty five deaths for every 1000 people in 1980 for Nigeria. There were 25 more births in Nigeria than deaths. This is called the **rate of natural increase**. The rate of natural increase takes place when there are more births than deaths.

$$\text{NATURAL INCREASE} = \text{BIRTH RATE} - \text{DEATH RATE}$$

Natural increase is sometimes referred to as a growth rate and is usually given as a percentage. Using the formula for working out natural increase and growth rate, Nigeria's natural increase and growth rate are calculated respectively below.

Country: NIGERIA	
Birth Rate	= 50 births per thousand people
Death Rate	= 25 deaths per thousand people
Natural Increase	= Birth rate – Death rate (50 – 25 =25)
Growth Rate	= $25/1000 * 100 = 2.5$
	= 2.5%

It is important to know the population growth rate at which a country's population is growing so that the government can effectively plan for development and service delivery. Countries with high growth rates have high increase in population growth and distribution while countries with low growth rates experience low distribution and population growth rates. This can happen on a global or local scale.



It is also important to note here that the time taken for a country's population to double depends entirely on the growth rate.

Doubling Time is the time taken for a country's population to double. It depends on the growth rate. The formula to working out the doubling time is given below.

$$\text{Doubling Time} = \frac{70}{\% \text{ growth rate per year}}$$

For example if the population of Vanuatu is growing at 2 % per year then the number of years to double its present population is

$$\text{Doubling time} = \frac{70}{2} = 35 \text{ years approximately.}$$

This indicates that in 35 years' time the population will double. If the country's population was 7, 000,000 in 2016 with a growth rate of 2 % per year then by the year 2051 the population will be 14,000,000.

Countries with higher population growth rate have faster doubling time

In economically less developed nations there are high birth rates combined with low death rates resulting in a very high population growth rates similar to the situation experienced in Europe in the last century. Most of these nations tend to have a faster population doubling time. However in these countries only the births and deaths that occur in hospitals and clinics are recorded .There are no official records of those births and deaths that occur in the villages and other remote areas across the country and because of this most of the information gathered on population growth is unreliable and not accurate.

To collect actual and reliable information about the changing population a ***nationwide population census*** (an attempt to count every person living in a country at one particular time) is conducted. In Papua New Guinea the first nationwide population census was conducted in 1990.

On the other hand well developed and wealthy nations *have* low birth rates and low death rates and as a result the population growth rate is low .This result in slower population doubling time and is common in most Western European countries. Information gathered on population growth is reliable and accurate because all births and deaths occurring are recorded and certified. This method of collecting information about births and deaths is called ***vital registration*** .



The table below shows the birth rate, death rate and natural increase for selected countries in the world in 1996.

Figure 6: Death Rate, Birth Rate and Natural Increase for Selected countries in 1996.

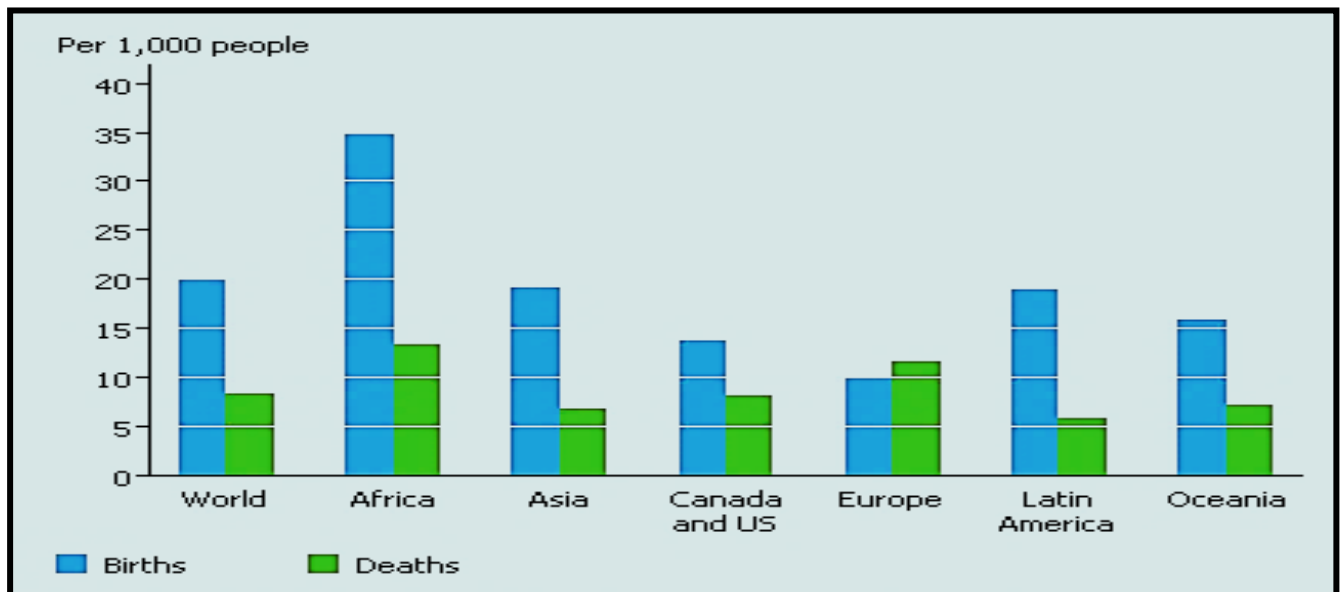
	Country	Birth Rate	Death Rate	Natural Increase
1	Australia	14	7	7
2	Brazil	25	8	17
3	China	17	7	10
4	Ethiopia	46	16	30
5	Italy	9	10	-1*
6	India	29	10	19
7	Indonesia	24	8	16
8	Japan	10	7	3
9	Mexico	27	5	22
10	Nigeria	50	25	25
11	Canada	11	9	2
12	Russia	9	15	-6*
13	Saudi Arabia	36	4	32
14	Sweden	12	11	1
15	USA	15	9	6

* Indicates negative growth rate—developed nations (Russia and Italy).

Sources: ENCARTA: 1990.



Figure 7: Bar graph of Global Population: Death Rates and Birth Rates



Source: Encarta: 2008

World Birth and Death Rates

Demographers use birth and death rates to determine population growth and evaluate the general health of the populations they study. These rates usually denote the number of births and deaths per 1,000 people in a given year. The chart above shows the estimated birth and death rates for major regions of the world.

Developed and Developing Nations

Poor developing countries in the world have higher population growth rates and much faster doubling times. The current average rate of population growth for developing countries is 2.3 percent. These countries must try to increase their population support services and resources like food, water, shelter and social services in that very short period of time. It is also obvious that since most of these countries are poor, they are not able to meet the growing populations' demands of better schools, hospitals, houses, employment opportunities and other vital infrastructure developments. People in developing countries live a very low standard of living and experience so many difficulties. Most of the people in the developing countries then migrate to developed nations to seek a better life and opportunities. Today, a lot of South Americans are migrating to the United State of America seeking better life.

Developed and rich countries have lower population growth rates, thus less doubling time. This is because of the governments most stringent and effective population growth control and management policies. Most of the European nations have in recent time's experienced negative growth rates as a result of very effective population control legislation put in place by their governments. People in developed nations generally enjoy a very high living standard.



Reasons for Population Growth:

Low death Rates

The reason for population growth may vary from one country to the other and to some extent, depend on the prevailing social, economic and political conditions but most population experts believe and stated that the main cause of rapid population growth is the lowering of the death rates. The lowering of death rates meant that firstly people live longer years or had a longer **life expectancy** and secondly more babies born did not die in the first year but survived which greatly reduces the **infant mortality rate**.

The increase in life expectancy and decline in infant mortality rates were believed to be triggered by the advancement in medicine, nutrition and health services with improved living and working conditions over the last century which started in Europe as a result of the industrial and agricultural revolution and eventually spread to other parts of the world.

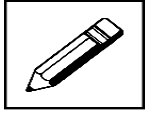
During the time of industrial revolution and onwards European countries experienced rapid population growth but have eventually stabilized their population with low growth rates with effective population control measures, policies and migration. However population growth rates continue to increase in poor developing nations where most Europeans migrated to as convicts, as free settlers or as missionaries of religion. The migration of these Europeans helped further reduce the overpopulation pressure in Europe.

The migrating Europeans brought with them improved knowledge and skills on hygiene, medicine and nutrition with them and imparted them to the local people in the developing countries which then helped to reduce death rates and increased birth rates in the developing countries. This then started of the massive population growth rates currently experienced in the developing countries including Papua New Guinea.

Tradition and Customary Obligations

Tradition and customary practices also influenced the growth of population in developing countries in Africa, Oceania and Asia where family values and practices are still kept. For example in Papua New Guinea married couples who have many children were considered fortunate as children were considered as assets to the family, clan and tribe. The children look after parents and economically produce and contribute more wealth and resources to the family and clan. This practice encourages fertility and increased birth rate.

The most common trend in developing countries including Papua New Guinea now is the combination of both the customary factor and the lowering of death rate and infant mortality rate as a result of technological improvements in health, medicine and agriculture with improved nutrition and sanitation.



Student Learning Activity 3

- Calculate how many years it would take for a population of 4,000 000 to double itself if the growth rate per year was:
 - 2 percent _____
 - 3 percent _____
 - 4 percent _____
 - 5 percent _____
- Complete the following table by calculating the natural increase for each of the following countries.

	<i>Country</i>	<i>Birth Rate</i>	<i>Death Rate</i>	<i>Natural Increase</i>
1	Australia	14	7	
2	Brazil	25	8	
3	China	17	7	
4	Ethiopia	46	16	
5	Italy	9	10	
6	India	29	10	
7	Indonesia	24	8	
8	Japan	10	7	
9	Mexico	27	5	
10	Nigeria	50	25	
11	Canada	11	9	

CHECK YOUR ANSWERS AT THE END OF UNIT SUMMARY



11.4.1. 4: Infant Mortality Rates and Fertility Rates

Infant mortality rates and fertility rates are also two important crude rates that have influenced the growth and distribution of the world human population and will continue in the future.

Infant Mortality Rate

Infant mortality rate refers to the number of babies born but die in the first year of their life, usually stated as a number per 1,000 births. Many less-developed countries have infant mortality rates above 100 per 1,000—that is, more than 10 percent of the children die in their first year. In countries with effective health and educational systems, infant mortality rates are about 15 per 1,000, or even lower.

Fertility rate refers to the frequency or numbers of live births a woman can actually have during her reproductive life if she experienced the fertility rate at each age. (This does not include women who have the potential to give birth but do not do so due to reasons only known to themselves). An alternative word for the capacity for reproduction is called the **Fecundity rate**.

Types of Fertility Rate

There are two types of fertility rate, **Total Fertility Rate (TFR)** and **Replacement Level Fertility (RLF)**. Total fertility rate is an estimate of the average number of children that would be born alive to a woman during her lifetime if she passes through all her child bearing years (ages 15–44) conforming to age specific fertility rate of a given year.

Replacement level fertility (RLF) is the number of children a couple must bear to replace themselves. The actual two children per couple in most developed countries can go as high as five in some least developed countries, mostly because some female children die before reaching their reproductive years.

Fertility rate in Developed Countries

High-fertility countries may have birth rates of 40 or even 50 babies born per 1,000 populations per year. Corresponding levels of the fertility rate would be 5 to 7 children per woman. Low-fertility countries have birth rates of 15 to 20 per 1,000 people and fertility of about 2 children per woman.

Developed nations (Sweden, Norway, Switzerland and others) have generally lower fertility rates for several reasons. First due to the government regulation and policies on population growth and control many fertile women both married and unmarried chose to use contraceptive to control births. Various contraceptive methods and family planning methods are readily made available to the people. In the United States of America, the use of contraceptives is very high among married women which greatly reduces the fertility rates.

Fertility in a population is also influenced by the age–sex composition. A developed nation tends to have a healthy population and as a result, has a relatively large proportion of old



people and less number of younger people which greatly influence and reduces fertility rate among the women population. Women also have been found to have equal status with men and participate in all sectors of the economy and do not have time to have more children.

Fertility Rate in developing nations

In developing countries fertility rates are very high first as a result of the very high percentage of young people in their population composition. Due to family values and religious beliefs more children born in to a family are considered as assets.

Secondly, knowledge about contraceptives and birth control methods are not widely accepted among the population. Women are not given equal status with men to participate evenly in the economic development process and still live submissive lives under oppressive customary laws.

In Papua New Guinea contemporary family values enable married couples to have more children so that the children can look after their parent's society in older years. Fertility rate contributes to the rapid growth of population. In developing countries where the rate is high, birth rates increases and enables the population to grow. Developed countries have low fertility rates resulting in slow population growth.

Infant Mortality Rate.

In countries where fertility rates are high lot of babies are born and most of these babies live past their first birthday due to improved health and medicine. On average a lot of babies born today live longer causing a general decline in the infant mortality rate. One notable trend on this is the very high young population composition in the third world countries as a consequence of high fertility rate and lower infant mortality rate.

In developed nations infant mortality rate is very low due to the availability of modern medicine, health facilities and nutrition but the number of babies born are less because of the low birth rates ,low fertility rates and effective population growth control measures and legislation. Hence the population growth here is still slow stationary or negative.

Therefore high births rates, high fertility rates, low death rates, and low infant mortality rates significantly contribute to rapid population growth while high death rates, high infant mortality rates and low fertility rates can cause the population growth to slow down or become stagnant or negative.



11.4.1.5: Population Pyramids

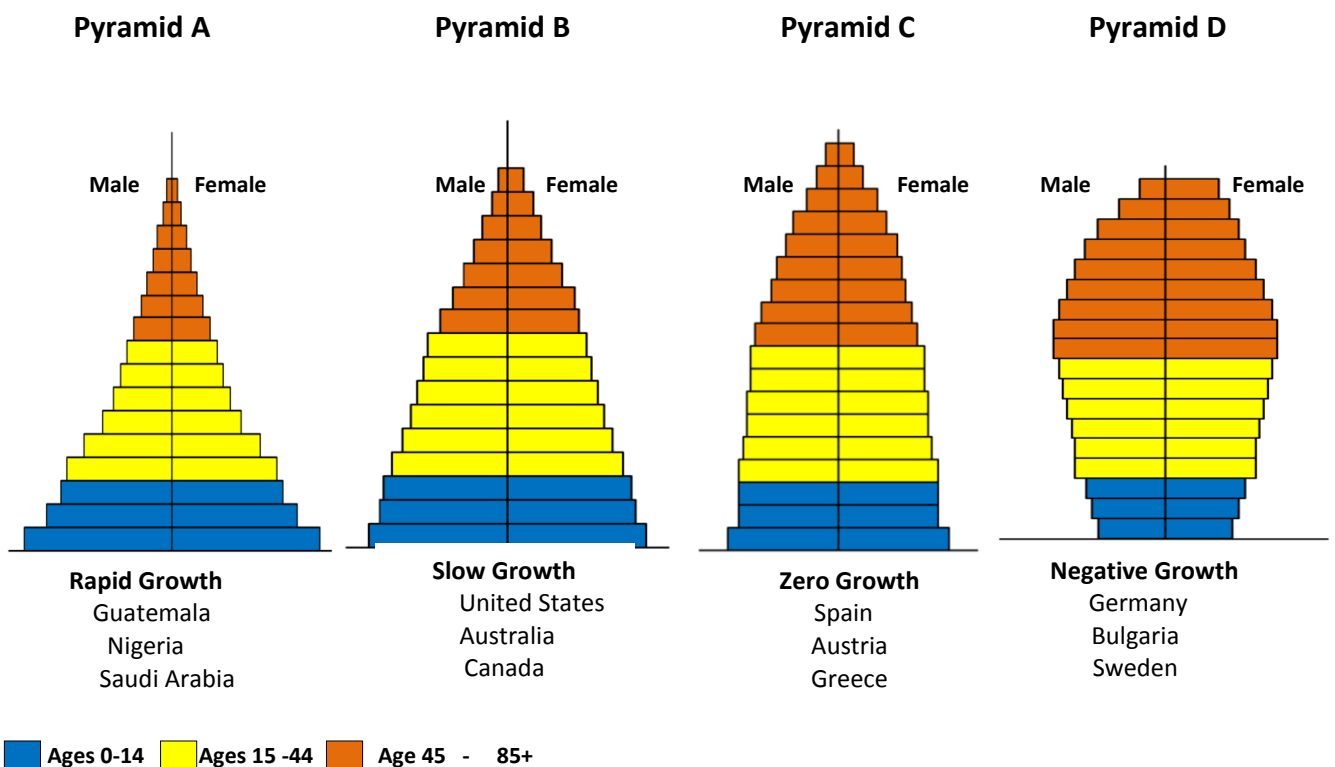
Population Pyramids

When studying population it is essential to look at its structure. The way to do this is to look at the age and sex composition of the population. This vital information can be represented diagrammatically by a population pyramid.

The population pyramid shows the proportion of males and females at 5 year age intervals. From the population pyramid, it can be determined whether the population is growing, stable or likely to decline. As a country moves through each stage in the demographic transition model the shape of the population pyramid changes

The population pyramid also clearly indicates the dependency load of a country. **Dependency load** is primarily the number of older people and younger people in the population who depend entirely on other people and are not part of the work force. People who are unemployed are also included in this category.

Figure 8: Common Population Pyramids used in Age –Sex Distribution



Source: Complete Geography



Figure 8 shows four common and widely used population pyramids. The following are brief descriptions of each pyramid and what each represents in terms of population structure and composition.

Pyramid A: Represents the population structure of a typical developing country like Papua New Guinea, Solomon Islands and Nigeria. It is characterized by:

- (a) a large number of young people (age: 15—44)
- (b) a large number of babies and children (age: 0—14)
- (c) lesser number of older people (age: 45—74)

Pyramid B: Represents a very slow population growth structure that is experienced by many developed nations like Australia and the United State of America. It is characterized by:

- (a) larger population of middle age and older people due to healthy living.
- (b) less number of babies and children due to decline in birth and fertility rate
- (c) effective population control policy enforced by the government.

Pyramid C: Represent zero growth rates and is experienced by some European countries like Spain, Austria and Greece. It features include:

- (a) large number of middle and old age population due to healthy living.
- (b) few babies born and low fertility rate due to population control legislation.
- (c) effective use of contraceptives and family planning methods.

Pyramid D: Indicates a negative growth in the population and is common to some developed countries in Western Europe like Germany, Sweden and Bulgaria and is characterized by:

- (a) fewer birth rates and decreasing youth population.
- (b) longer life span due to healthy living and large number of old people

Comparison of Population Pyramids: Developing and Developed Nations

Figure 9 is a population pyramid that is commonly used to represent the population structure of developing countries like Fiji, Papua New Guinea and many others. It has a wider base that clearly represents a very high birth rate resulting in large number of growing young dependants. With increasing age, the pyramid gets narrower as a result of low life expectancy and high death rate. Living standards are low in those countries.

Figure 10 is a pyramid that is widely used to represents economically developed nations like Australia, Japan and others. It has narrow bases that indicate low birth rate resulting in less or declining young population. With increasing age, the pyramid bulges and there are more elderly dependents due to low death rate and higher life expectancy. People in those countries enjoy a very high living standard.



Figure 9: Population Pyramid of Developing Countries

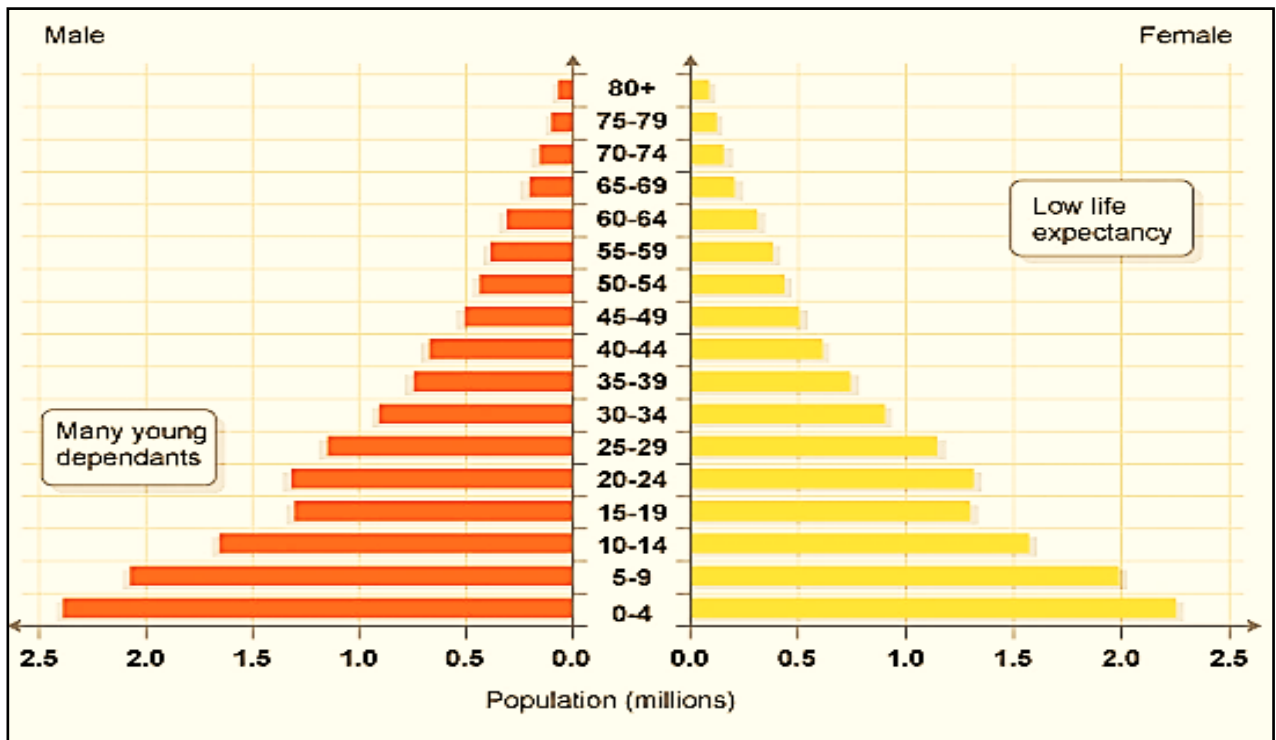
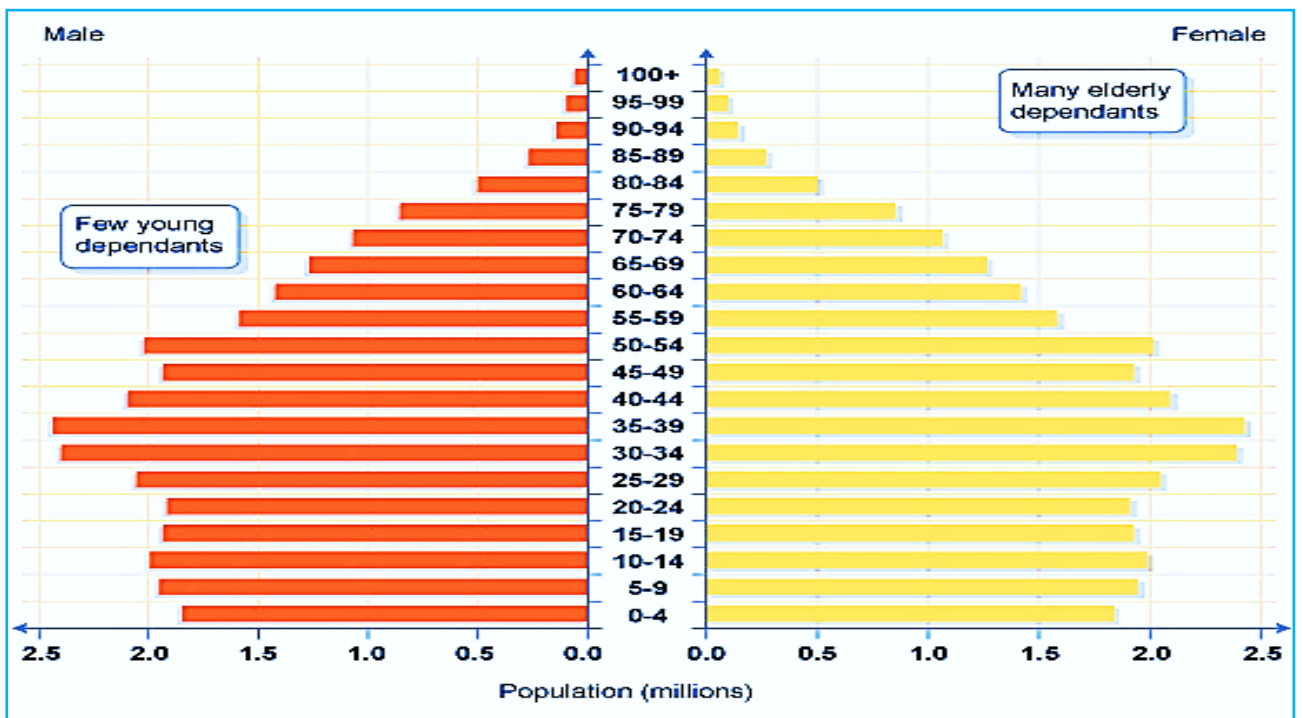


Figure 10: Population Pyramid of Developed Countries



Vital Features of the Population Pyramids.

To understand and accurately interpret data from the various types of population pyramid models used in population studies it is important to define and understand the functions of the various elements of the graph. Some of the important components of the pyramid include the age-sex group intervals of five years, the population total, time in years, the bulge and the dip.

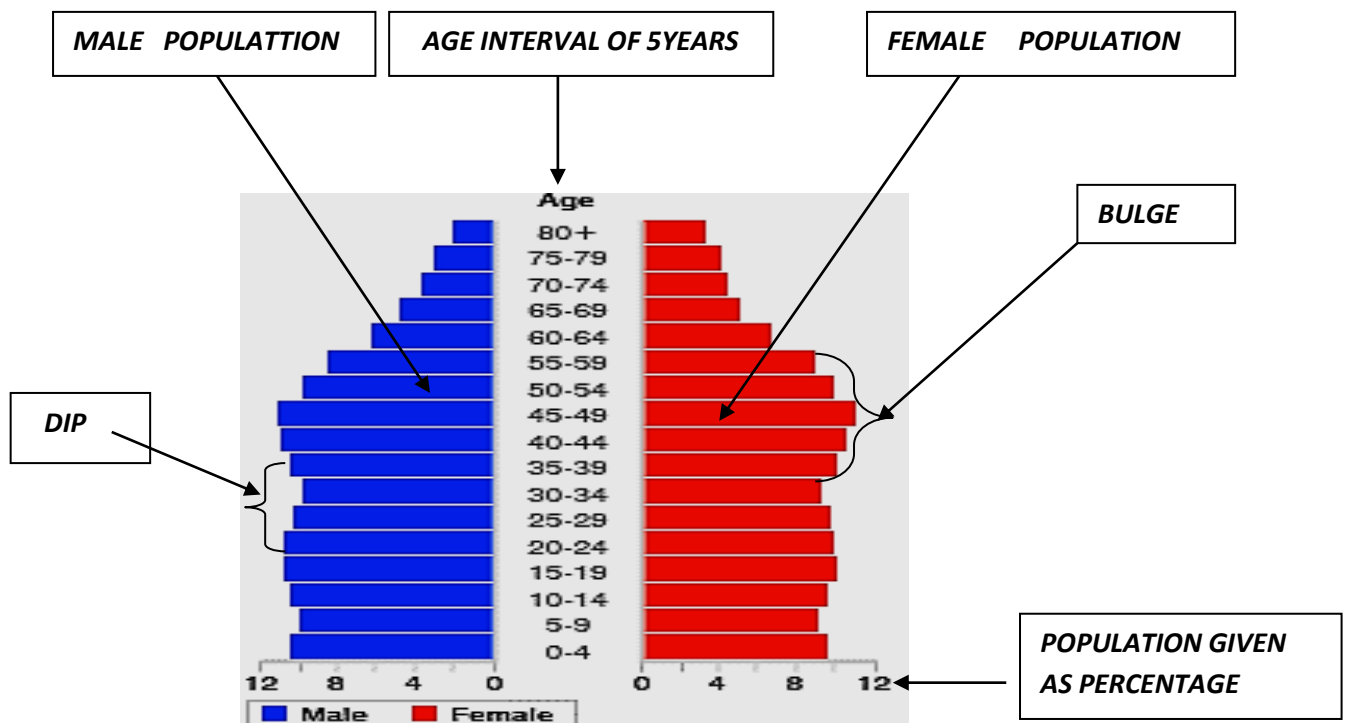
The **bulge** is any part of the pyramid that grows and curves outwards. It usually indicates a sharp growth or increase in that particular age group as a result of baby boom, mass immigration or rise in fertility rate.

The **dip** is the opposite of bulge. It is any part of the pyramids that curve inward and form a hollow on the pyramid. It represents a sudden decline in the population as a result of war, disease, pestilence and economic hard times.

The **population figures** are given on the x or horizontal axis of the graph. In most pyramids they are usually given in percentages. However some are given in figures for example in actual figures in thousands or in millions.

The **age and sex** group is represented in the middle of the graph starting from the very young age group right at the base of the graph to the very old age group at the top at an interval of five years.

Figure 11: Components of a population pyramid.



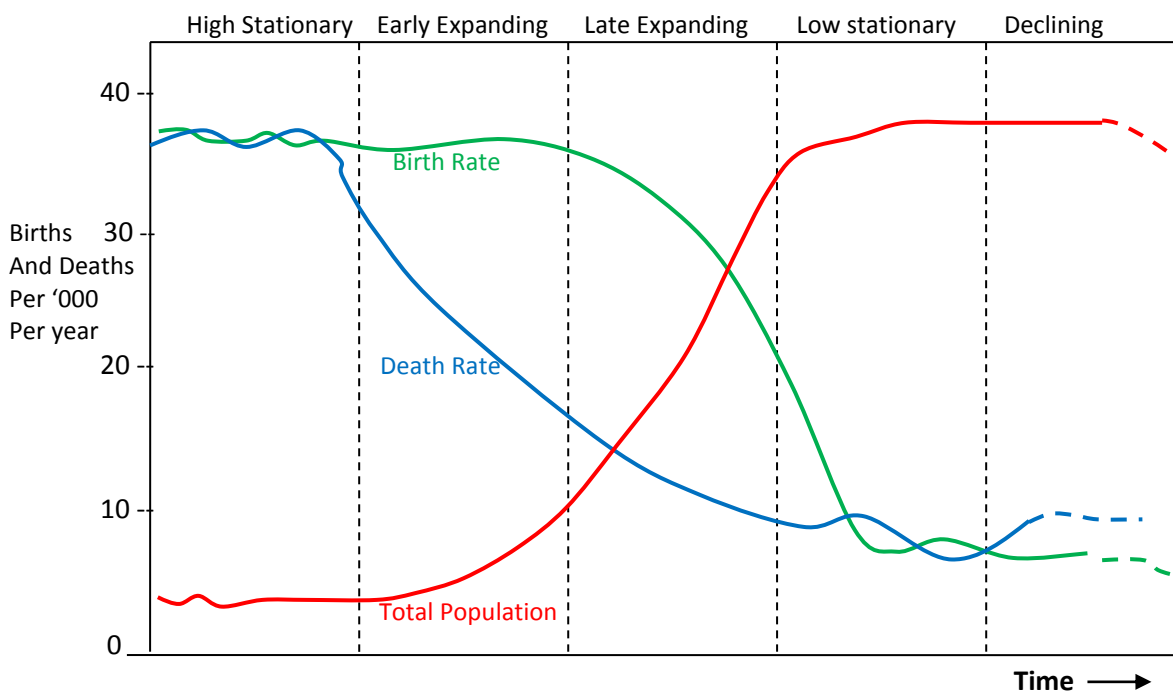
Source: Encarta :2008



11.4.1.6: Demographic Transition Model

The demographic transition model is a method which is used to show what might happen and what will happen to a population's birth rate, death rate and natural increase in time. This model is good for describing changes in Europe but it is not appropriate for developing or other less economically developed countries. However it does show that developing countries experienced different problems to those of Europe a century ago.

Figure 12: Diagram of Demographic Transition Model



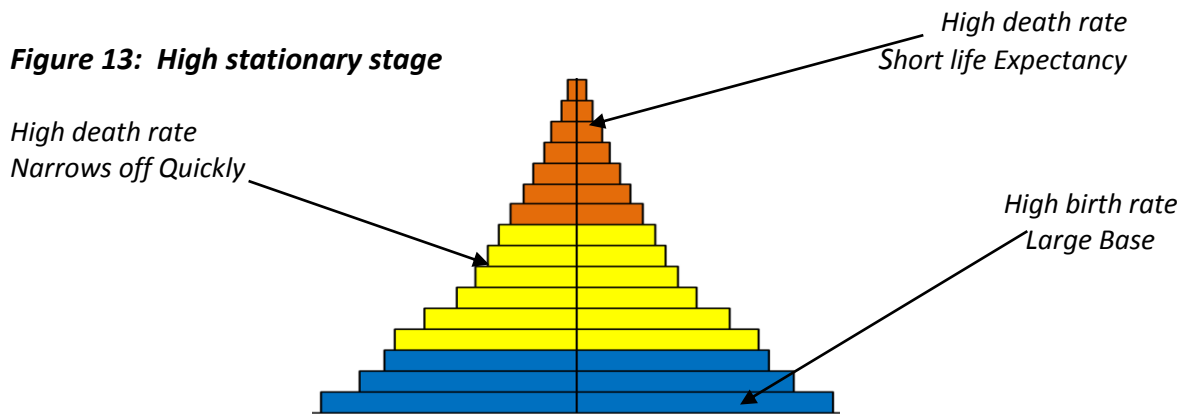
Source: Complete Geography: 1990

The model has five stages: **High stationary stage, Early expanding stage, Late Expanding stage, Low stationary stage and Declining stage.** Demographic events that occur in each of the five stages of the model and the population pyramids that correspond to each stage and event are thoroughly discussed below.

High Stationary Stage is the first stage and is characterised by high death rate and high birth rate. High death rate is due to poor nutrition, famine, wars and infectious diseases such as cholera and typhoid while birth rate remains high due to low family planning, low status of women and a high infant mortality rate as children add to the family income through child labour. This model can be found in countries like Sudan, Somalia and some other poor developing nations.

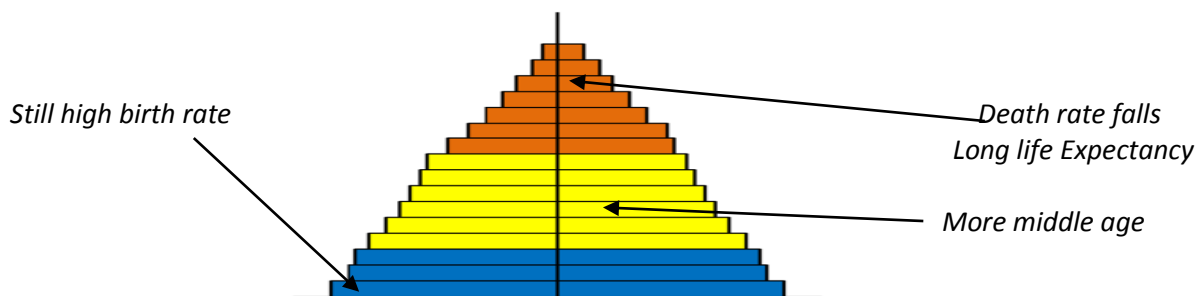


Figure 13: High stationary stage



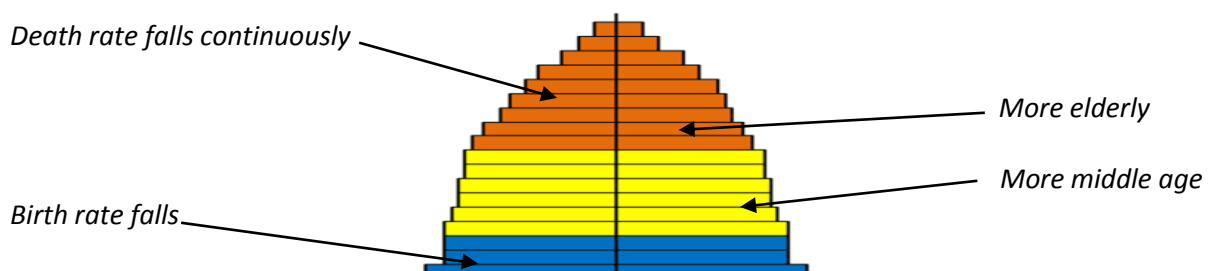
Early Expanding Stage is the second stage where birth rate still remains high but death rate begin to fall due to improved medicine, hygiene, nutrition, sanitation and water supply. The appropriate pyramid for this stage drawn below. This model can be found in countries like Fiji, Nigeria and many other developing countries.

Figure 14: Early expanding stage



Late Expanding Stage is the third stages of the demographic transition model. In this stage death rate continuous to fall due to advance improvements in health, hygiene, nutrition, sanitation and water supply. Care and nursery for the elderly are also introduced. Birth rates start to fall as children are prevented from working and so become a drain on the family's wealth. Infant dead reduced and family planning techniques become common and widely accepted. Status of women rises and marriage age increases. This model is common to countries like Australia, USA and many other developed nations.

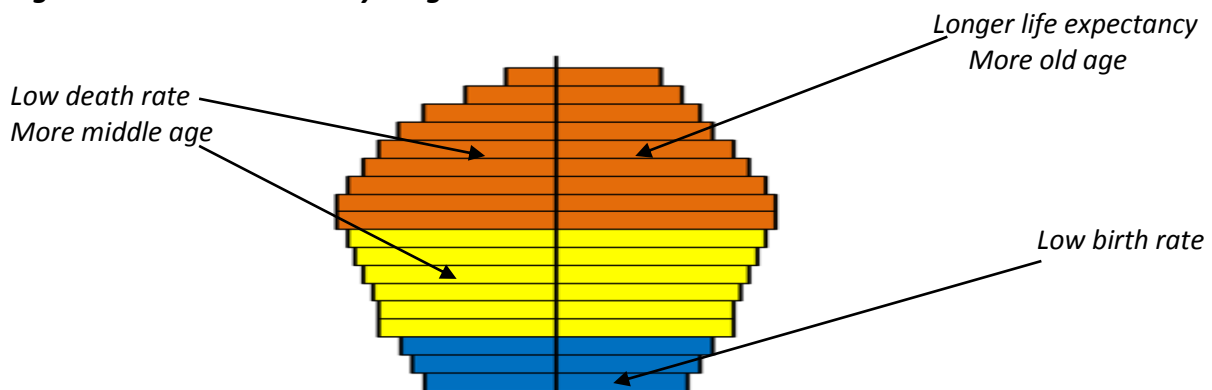
Figure 15: Late expanding stage





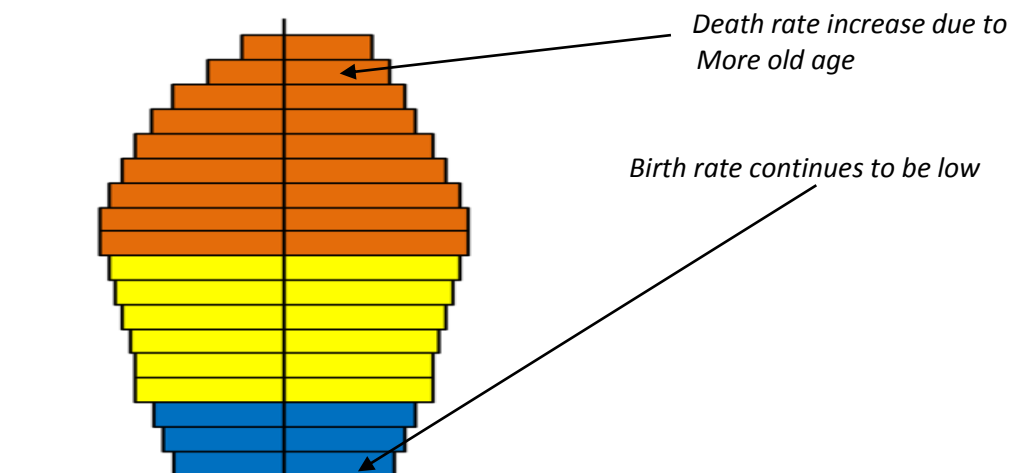
Low Stationary Stage is the fourth stage where death rate remains low and birth rate levels off through family planning. The desired size for the family matches the achieved family size. Countries that fit in to this stage includes England, Germany and Israel. This is the fourth stage.

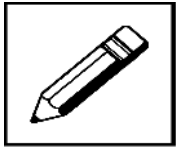
Figure 16: Low stationary Stage



Declining stage is the last stage of the model. Death rate could increase as a greater proportion of the population is elderly but birth rate continues to be low and financial and job insecurity may reduce it even further. This model is common to European countries like Sweden, Austria and Norway.

Figure 17: Declining Stage





Student Learning Activity 4

1. Complete the following table on the 5 stages of the demographic transition model. High Stationary Stage (stage one) has been done for you as an example.

Stages	Births	Deaths	Other features
High Stationary Stage	High birth rate	High death rate	Common in countries like Sudan and Somalia
Early Expanding Stage			
Late Expanding Stage			
Low Stationary Stage			
Declining Stage			

2. State one reason why the demographic transition model is not appropriate for developing and poor third world countries and other less economically developed nations.

CHECK YOUR ANSWERS AT THE END OF UNIT SUMMARY



11.4.1.7: Internal and External Migration

Since the world population is unevenly distributed in terms of relative spread and density, people continuously move from one location to the other either to settle permanently or temporarily in response to the lure of a more favourable region or because of some adverse conditions back in their home environment.

Migration can be defined as the movement of people, especially of whole groups or individuals from one place, region, or country to another. The people leave their place of birth where they have been living and move to another place to take up residence there. Human migration can be seasonal or periodic depending on the factors that causes the people to migrate.

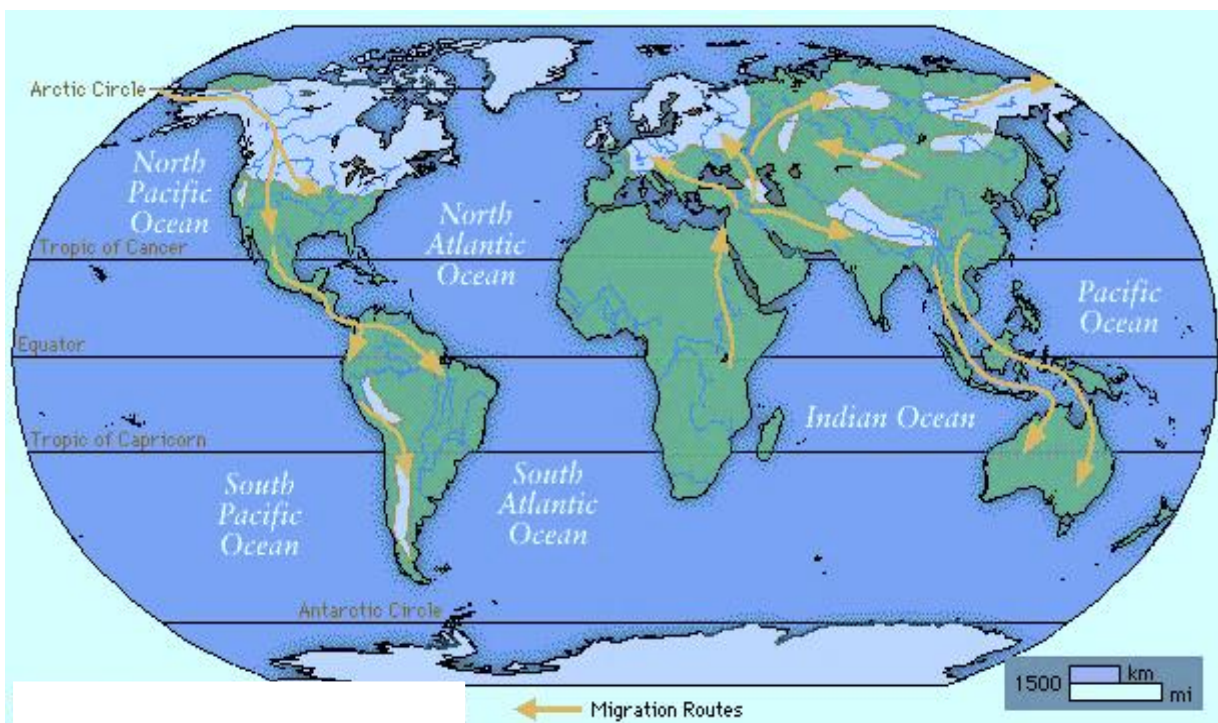
Forms of Migration.

Migration that involves permanent change of home is called **permanent migration** but temporary movement of people such as the seasonal movement of nomadic people can be referred to as **temporary migration**.

Migration can be voluntary or forced. **Voluntary migration** occurs when people move freely by choice without any form of undue influence. It is more common than forced migration and occur because people want better living standard and greater personal freedom.

Forced migration occurred when people are forced to migrate against their will for a variety of reasons, both natural (famine, disease) and man-made (slavery and war)

Figure: 18: Major Routes of Migration





Pull and Push factors

People can be forced to migrate or can be attracted to migrate. Attractions in an area that lures people to migrate to an area are called **pull factors**. Some examples of pull factors are booming jobs and economic activities, employment and education opportunities. Unpleasant conditions in an area that forces people to migrate to other places are called **push factors**. Examples of push factors are, war, famine and diseases, political persecution and oppression and religions. In recent times political instability in the Middle East has forced a lot of people to migrate to Europe.

Internal and External Migration

Migration basically is the movement of people within countries and between countries. Migration within a country is referred to as **internal migration** while migrations between countries are referred to as **external migration**. One of the most common forms of internal migration in developing countries is **rural –urban drift** where a lot of people from the rural and remote areas migrate to urban areas searching for a better life. In Papua New Guinea people from all provinces migrate to Port Moresby city.

In recent times a lot of rich people from Papua New Guinea and other smaller Pacific Island countries have moved down to Australia to become permanent residents. This is an example of external migration.

Emigration and Immigration

The movement of people out of a nation into another country with the intention of residing there is referred to as **emigration**. The contrasting term **immigration** refers to the movement of people moving in to a nation. Hence in emigration people move out of a nation whereas in immigration people move in to a nation. For example a Fijian moving in to Papua New Guinea is immigrating while a Papua New Guinean moving out of Papua New Guinea and in to Fiji is emigrating.

Figure 19: *The photograph below shows young Italian immigrants to USA*



Source: Encarta 2008



Temporary and Permanent Migration

Migration can be temporary or permanent. Permanent migration occurs when people move with the intention of permanently taking up residence in their new country or location. Movement of seasonal workers, students, tourists and others who temporarily change residence for work, study and leisure purposes are considered as temporary migrants.

Rural –Urban Drift.

This is a form of internal migration in which people mostly from rural areas migrate to urban areas in the hope of finding a better life and improved living conditions. In developing countries like Papua New Guinea, the bulk of the population are unevenly distributed in the remote rural areas. In Papua New Guinea today all the people from the 22 provinces are migrating to the capital city of Port Moresby. There is also rural to rural migration and urban to urban migration. The main reason for rural urban migration in Papua New Guinea is the uneven distribution of the country's wealth and development infrastructure like education, health and transport facilities.

Figure 20: *A squatter settlement in Port Moresby*



Source: Encarta 2008

Squatter settlements, shanty towns and Soweto's

One of the most common problems associated with rural urban migration is the growth of squatter settlements and shanty towns on the city margins. Because the city officials do not plan and cannot provide decent accommodation to all those who are migrating into the city, the migrants quickly build squatter and shanty type houses illegally at the fringes of the city.

Squatter settlements and shantytowns are unplanned, unhygienic and overcrowded. They impede proper planning and development of the cities. In Papua New Guinea squatter settlement is one of the biggest problems challenging the development of towns and cities.



All these unplanned illegal settlements have different names. In South Africa and many other parts of Africa they are called **Soweto's**. In Papua New Guinea and parts of Oceania they are called **Squatter Settlements** and in some countries in South America and Central America they are referred to as **Shanty Towns**. Other countries also have local names, like in Peru the settlements are known as "**Pueblo Jovenes** "

Legislation on internal migration in Papua New Guinea.

Currently there is no law established to regulate the movement of people in and out of the country by the government of Papua New Guinea. Internally people can move freely from rural areas to urban areas and vice versa. However due to the overwhelming growth of squatter settlements in major city centres like Port Moresby and Lae, the government has in recent times introduced the "**Vagrancy Act**". This act has been debated in parliament and will eventually become law.

Vagrancy Act

Once the Vagrancy Act becomes law then the issue of internal migration in this country will be effectively controlled and monitored. Once internal migration is controlled then other related issues like the very fast growth of squatter settlements will eventually be brought under control. The situation of internal migration and eventual growth of squatter settlements prevails not only in Papua New Guinea but also in other poor developing countries especially in the South America, Africa, Asia and Oceania regions.

Effects of Migration on population growth

Migration is an important contributor to changes in population. The population of a country will rapidly decline if more people die or emigrate out of that country. For example between 1840 and 1970 a severe famine hit Ireland and many people emigrated to the United States of America and Great Britain. Some that remained back in Ireland died of starvation. During that time Ireland lost one fifth of its population and its total population decreased so quickly. At about the same time many emigrant groups from other European countries including the group from Ireland moved to the United States of America to farm or work in the new American cities. The population of the United States of America increased rapidly.

Figure 21: Mexican immigrants to the United State of America



A majority of immigrants to the southwestern United States arrive from Mexico. . . This Mexican family was photographed in 1912 as they prepared to cross the Texas border...



Student Learning Activity 5

1. Define the word **migration**

2. State the difference between :

(a) **internal** and **external** migration.

(b) **forced migration** and **voluntary** migration.

3. What will happen to the population of a country if more of its people **emigrate**?

4. Name three examples of **push factors** that forces people to migrate

5. Discuss the reasons for the growth of **squatter settlements** in major cities and towns in Papua New Guinea.

CHECK ANSWERS AT THE END OF UNIT SUMMARY



11. 4.2: POPULATION TRENDS IN PAPUA NEW GUINEA AND THE WORLD

Introduction

Population trends vary from country to country but similarities also exist. Patterns of population growth and change experienced by developed countries are quite different from that experienced by low developing and poor countries. Developed countries are considered to have already gone through the first and second stage of the demographic transition model and are in the third and fourth stages while developing countries are considered to be in the first and second stage of the demographic transition model.

Population trend in the World.

Generally birth rates, death rates and fertility rates are low in industrial and developed nations resulting in a slow, zero or negative growth rate. They have a high percentage of older and middle age population and decreasing number of younger people. Most of these countries have established and effective population control policies in place. More than 75% of total population live in urban areas and enjoy a very high standard of living.

Developing and poor nations on the other hand experience a high birth rate and high death rate. Other rates such as infant mortality rates and fertility rates also vary but are generally high resulting in a very high population growth rates. At the same time most of these developing nations do not have proper population growth control policies and legislation in place. They have a high population of very young population and a very high dependency rate.

Apart from demographers, *Economists* have often distinguished between developed and developing nations in analysing world population trends. Generally, nations considered to be less developed or developing have a lower standard of living than developed nations. A larger share of the population in these countries live at subsistence levels, and medical resources are limited. Hence population growth in less developed nations occurs at a much faster rate than in developed nations.

An Exploding Population

From 1950 to 2000 the world's population grew from about 2.5 billion to more than 6 billion. The pace of population growth may continue to increase. Today the world's population is growing rapidly. The current estimated total world population is more than ten billion and Demographers have described this rapidly growing population as a **demographic time bomb**. Many experts fear that the world's population is increasing so fast that the resources of the planet may not be able to sustain the increase.



11.4.2.1: Population Trend in Papua New Guinea

Population change in Papua New Guinea has followed the same pattern as the rest of the world. People have lived in Papua New Guinea for at least 50,000 years. By 1960 the population had grown to one and half million people. In 1990 the national census counted over three million people. For thousands of years the population increased slowly but in just thirty years it doubled.

Prior to the 1970s, families in Papua New Guinea needed to have a lot of children for family wealth creation. Average families had six children but most of them died as a result of the very high infant mortality rate. In 1971, the infant mortality rate was 134 out of every 1000 babies born. By 1990, this figure had fallen to 91 out of every 1000. In the same year the average life expectancy of Papua New Guineans rose from just 40 years to 50 years due to improvements in health, nutrition, medicine and hygiene.

Despite the improvements in health and medicine many people still die from infectious diseases. The main cause of death in Papua New Guinea in 1984 was pneumonia (22.7 percent) diarrhoea (7.4 percent) and tuberculosis (5.5 percent). As well as this 7.6 percent of the deaths were caused by malaria and 9 percent were infant deaths (within 28 days of being born).

The population of Papua New Guinea is unevenly distributed throughout the country. More than 85 percent of the population live in the rural areas while the remaining 15 percent live in urban areas. In the rural areas, people only settle along river valleys and fertile plains along the coastal areas and in the highlands.

Current Growth Rate and Other Vital Statistics.

Today the total population of Papua New Guinea is approximately 10,000,000 people and has a population growth rate of about 3 percent per annum which is one of the highest in the Asia Pacific region. Total population density is 21 persons per square kilometre and the country's population is expected to double in 23 years' time to 20,000,000.

Figure 22: Prime Minister Peter O'Neill declaration of the country's total population.

O'Neill: Population is 10m

By MALUM NALU
PRIME Minister Peter O'Neill says the country's current population may be as high as 10 million, with the country having one of the fastest growing populations in the world – at 3 per cent per year.
He told a public service executive leaders' forum in Port Moresby yesterday that the high growth rate posed a big challenge on public service delivery.
“That estimate is given very much as a guess. It could be even more,” he said.
“Some say our population is 10 million. Many say that it's 8 million. “A difference of two million is quite a lot. But indications are that there is a 10 million population in the country – if you look at some of the satellite imaging that is provided to the Government.”
O'Neill said the public service must be in a position to meet public demand.
“We need a public service that is geared towards meeting the demands of that population. This is very important,” he said.
O'Neill also called for a stop to wastage in the public service.
“That wastage must stop. The wastage of resources, the wastage of talent, wastage of experience that you have,” he said.
“We must continue to build strong leadership in all our organisations. “People will only judge us by our performance. There is no other measurement, except your performance.”
O'Neill advised public servants to carry out their duties and responsibilities diligently.

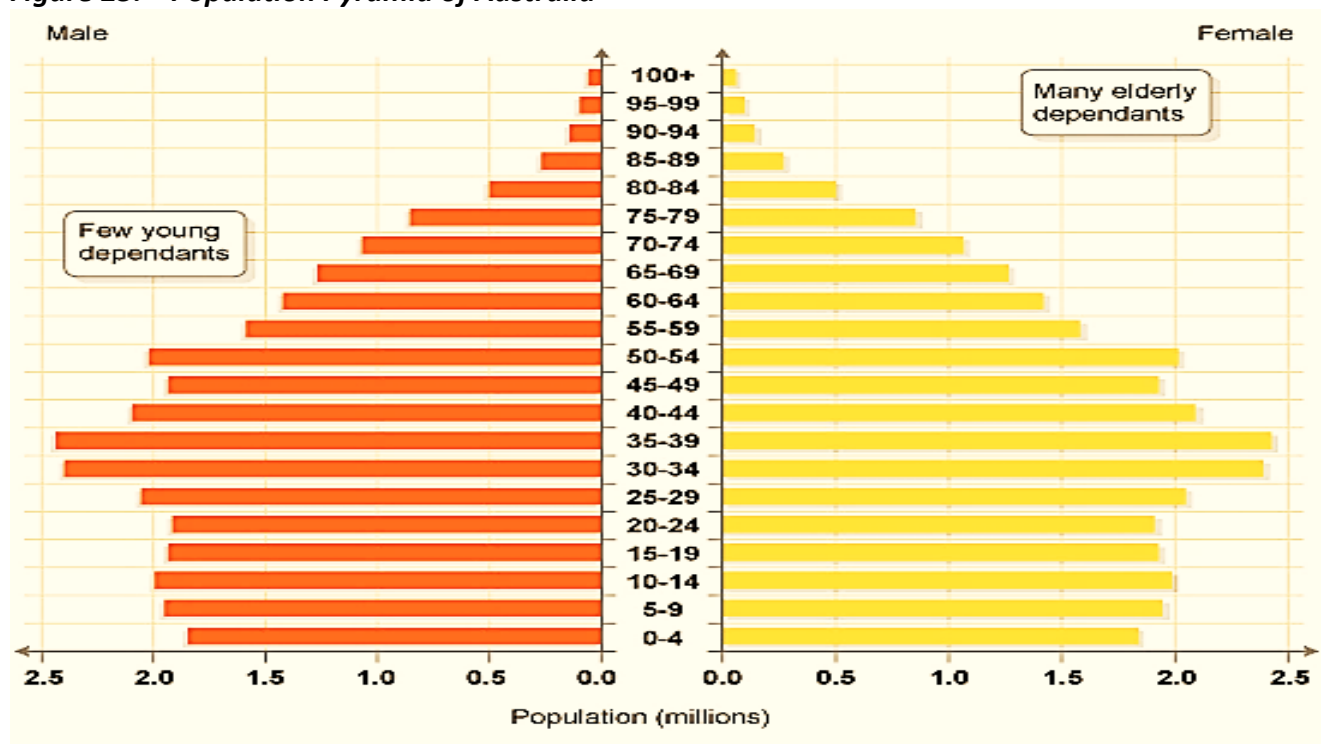


On Thursday, 17 March 2016, the *National News Paper* published the Prime Minister of Papua New Guinea, Mr Peter O'Neill's public declaration that the country's population was 10 million and that the growth rate was 3 percent per annum. Figure 22 shows the *National News Papers* coverage of that declaration.

Comparing Papua New Guinea with Australia

Australia being a well-developed and advanced country has a low birth rate and low death rate. This resulted in large numbers of older people still living and less number of young populations. It has a high dependency ratio of older people and low dependency ratio of young people. People generally enjoy a very high standard of living.

Figure 23: Population Pyramid of Australia



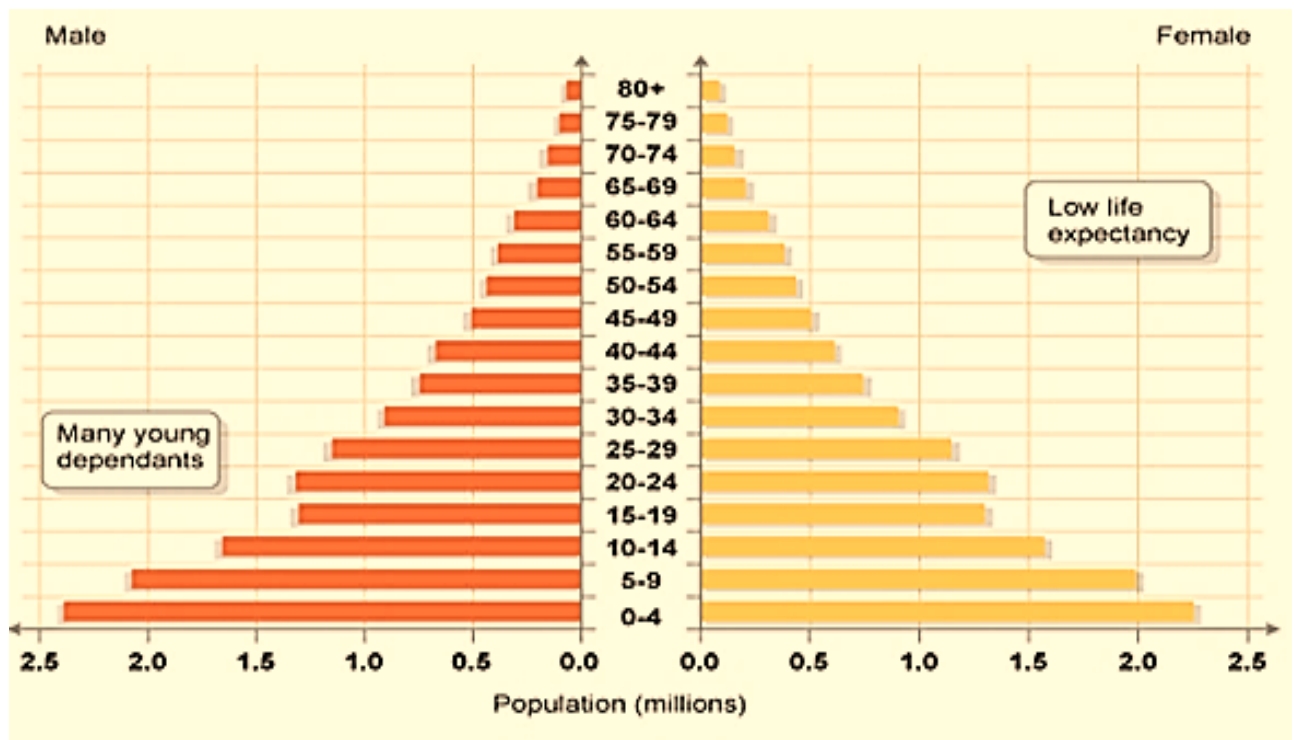
Papua New Guinea

On the other hand, Papua New Guinea as a developing nation has a population that is characterised by very high birth and death rates, large number of young population (high dependency ratio of younger people and low dependency ratio of older people) and few elderly people. Living standards and life expectancy are low. This is indicated by a very wider pyramid base and decreasing steps upwards as indicated on the pyramid (**Figure 22**) on the next page.

When comparing Papua New Guinea's population structure, growth pattern and other relevant features with the Demographic Transition Model it is obvious that Papua New Guinea is in the second stage (Early Expanding Stage) of the demographic transition model as features described in this stage correspond directly to the country's population structure and composition.



Figure 24: Population Pyramid of Papua New Guinea





11.4.2.2: Population Policies.

A policy is a program of actions adopted by a person, group or organisation to achieve desired goals and objectives. Population policies are set of action plans devised by the government. They are designed to contribute to national development and achieve welfare goals through measures that, directly or indirectly, aim to influence demographic processes, in particular, fertility and migration. In most cases government population policies aim to effectively minimise rapid population growth and achieve sustainable population so that limited resources and wealth can be conservatively used and fairly distributed.

Examples of such polices include:

- Controls on immigration
- Minimum age for marriage
- Compulsory use of contraceptives
- One child per family

Control on Immigration

Many countries in the world have adopted effective measures to control immigrations into their country. They have policies in place which only allow people with genuine reasons to enter. Countries like China, Russia and Israel have very strict immigration policies.

Minimum Age for Marriage

Other countries in their effort to reduce population growth have introduced laws on marriage and family planning. By law a young man and woman in order to qualify for marriage must reach a certain age which is called the **Minimum Age for Marriage**. In China this law is effective and all citizens wishing to marry must be in that age or above it to qualify for marriage. The required age is eighteen years and above .This law effectively reduces birth rate and fertility rate.

Compulsory Use of Contraceptives

This is the most common and universally accepted population control method available to everyone in just about every country. In some countries, the use and application of various types of contraceptive methods are compulsory in line with government population control polices. Examples of such countries that encourage compulsory use of contraceptives are China, Iran, India and Japan.

In some countries, religious denominations totally disagree and preach against the use of contraceptives and other family planning method. The Roman Catholic Church and other Orthodox Christian Churches have publicly protested against the use of contraceptives. In other countries there is no law governing the use of contraceptives, it is voluntary.

One Child Policy

China is one country that has a very effective population control policy in place. Before that and prior to 1979, China had a huge population growth taking place in the country.

In order to curb that population growth, in 1979, Chinese authorities formulated a one-child-per-family policy, late marriage and birth control methods. The policy worked and today China remains one of the largest and most densely populated countries in the world that has

a very slow growth rate because the entire population growth control policy is effectively implemented and strictly followed by everyone.

The policy is referred to as the **“One Child per Family” policy**. The policy encourages every married couple to have only one child. Under that law any second or third child born in a family is considered illegal. The photograph below explains the one child policy.

Figure 25: Billboard for One-Child Families



A man and his child stand in front of a billboard that advocates a policy of one child per family in China. (Source; ENCARTA 2008)

Population Policy in Papua New Guinea.

After independence the government of Papua New Guinea did not have any concrete and specific population plan and policy in place. Even today at the time of the writing of this unit several law and policy making government agencies were consulted but not even one was able to produce a draft policy on population growth management and control in the country.

This is bad for a country that is experiencing a population explosion this decade. However it is believed that the current government is working on a draft population policy which will be tabled in Parliament soon to be debated upon and be made into law. Once this is in place, then Papua New Guinea will have a clear population growth control policy in place.

However, prior to 1975, the Australian Colonial Administration did have some form of population and internal migration policy in place. All the labourers from the highlands who were brought down to the coast to work on plantations were monitored and repatriated back home when their contract expired under strict supervision. This policy is no longer active.

What needs to be done?

At this point in time, Papua New Guinea is going through a population boom and if nothing is done to minimise this exponential growth then the rapid population growth will spiral out of control and will create so many social and economic problems and will even deplete the reserves of resources in this country. Therefore, the government must formulate a



population control policy quickly and implement it before other negative effects of this growing population can be seen in other sectors of the economy and environment in the country.

Figure 26: Facts about Papua New Guinea's Population (2016)

Population	10,000,000 (2016 estimate)
Population density	21 persons per sq km
Urban population distribution	15 percent (2016 estimate)
Rural population distribution	85 percent (2016 estimate)
Largest cities, with population	Port Moresby, 800,000 (estimate) Lae, 500,038 (estimate)
Population Control Policy	No policy / legislation in place
Chief religious affiliations	Protestant, 57 percent (57%) Roman Catholic, 30 percent (30%) Indigenous beliefs, 4 percent (4%)
Life expectancy	65 years (2008 estimate)
Infant mortality rate	45 deaths per 1,000 live births (estimate)
Literacy rate	77 percent (2000) (77%)

Source: Encarta: 2008



11.4.2.3: Population Control.

Control methods and Policies.

The rapid world population growth can be minimised and eventually be brought under control. It is not as easy a task but it can be done with proper planning, effective management and implementation of the policies. The attempt by governments, individuals and groups to minimise and reduce population growth with a clear and well defined policy framework can be referred to as population control methods or strategies.

Different countries may have different population control methods and strategies in place to suit their own social and economic conditions but universally, there are three basic areas in which population control methods can be devised and implemented.

- Economic development
- Family planning
- Socio-economic changes.

Economic Development

The development of industries and other economic activities can result in the decline of both death rates and birth rates. The population growth experienced will change from fast growth to slow growth to zero growth and eventually to a decline as described in the demographic transition model. This was experienced in Western Europe in the last century during the industrial revolution. Economic development encourages healthy living, family planning and even reduces fertility rate.

Family Planning

Family planning programs provide educational and clinical services to help married couples choose the number of children they want to have. Such programs can reduce a country's population growth rate faster than waiting for the demographic transition to take place. About 70% of women in developed nations use contraceptives while 39% of women in developing nations used contraceptives. Family planning is simple and can easily be used to control population growth and is available in every country.

In Papua New Guinea the National Department of Health has established maternity clinics within clinics and hospitals throughout the country and many married couples and other interested people receive professional advice on family planning to learn more about the various forms of contraceptive methods that are available.

Socio-economic changes.

Another way to encourage smaller families is to encourage the rights, education and work opportunities for women because when better economic and job prospects are offered, women tend to have fewer children. However, traditions and customs make these changes difficult in many developing countries. Socio-economic changes can decrease fertility and reduce population growth.

**Population control measures in Papua New Guinea.**

Papua New Guinea currently has no proper legislation and population control methods put in place by the government. However, the Health Department through its maternity clinics, has introduced family planning methods and the use of various contraceptive methods to the mothers attending the clinics. This does not work and the country still has a high population growth rate because most of the mothers attending the clinic are illiterate and do not understand the procedure well.

Secondly, there is no vigorous campaign and awareness done to really get the message across to the bulk of the people. Due to the high illiteracy rate and the lack of government support vital information about population control methods do not easily trickle down to the common people.

Now that the country's population is booming the government need to carefully explore and consider various options to devise some control measures which can be used to effectively control population growth. Some of the control measure options include:

- (a) Family planning methods (been in existence for some time in Papua New Guinea)
- (b) Compulsory use of contraceptive methods
- (c) Minimum marriage age requirement
- (d) One child policy

In the meantime, the people need to be thoroughly educated on the issue of population growth and the importance of family planning. A proper awareness and education program is needed to educate just about every citizen of this country. A nationwide awareness campaign on population control is required before laws can be made so that all the people thoroughly understand the importance of minimising population growth. An organised network of family planning and awareness has to be established nationwide through the department of health in hospitals and clinics.



11.4.2.4: The Increasing Population and its Implications

Implications of Increasing Population

It has been identified and stated that there are a number of factors that are responsible for the growth of world population including Papua New Guinea. In the past birth rates were high but the death rates were also high so the population remained relatively stable.

Periods of few deaths were followed by periods of widespread deaths due to disease, famine and war. The infant mortality rate was also high and many babies died in their first year of life. All of these contributed to a relatively stable population

Today the number of deaths has declined and fewer babies born die in their first year of life, resulting in a population boom. The rapid increase in population has been triggered by improvements in health and medicine, nutrition and hygiene and improved living conditions. The implications of this rapid growth of world population can be detected in both developed and developing countries.

However it is of equal importance to understand that human population growth is at the root of virtually all of the world's environmental problems. Although the growth rate of the world's population has slowed slightly since the 1990s, the world's population increases by about 77 million human beings each year. As the number of people increases, overcrowding generates pollution, destroys more wildlife habitats, and uses up additional natural resources as demand for food and other basic items for everyday survival increases.

Effects on developed countries

Many people in developed countries began to have fewer children when farming has become mechanised. Rural families no longer needed to have a lot of children to help with the farm work. In urban areas people began to realise that large families only become economic burden. Children became dependant on their parents for longer period of time, during the time of their education and the cost of living in urban areas became higher than in rural areas. Nowadays, in many developed countries, populations are not growing because death rates have been balanced with birth rates. They have a high percentage of old and middle age population and less and declining number of younger population.

Although rates of population increase are now much slower in the developed world than in the developing world, it would be a mistake to assume that population growth is primarily a problem of developing countries. In fact, because larger amounts of resources per person are used in developed nations, each individual from the developed world has a much greater environmental impact than does a person from a developing country. Conservation strategies that would not significantly alter lifestyles but that would greatly lessen environmental impact is essential in the developed world.

**Effects on developing countries.**

In developing countries the high birth rates combined with low death rates have resulted in a rapid population increase similar to the one experienced by Europe in the last century. Europe solve that problem partly by migration but today migration will not help the problem of developing countries as they do not have the military power and resources to move into new areas. Developing countries do not have the option available to them today that developed countries had in the seventeenth and eighteenth centuries.

High dependant young population

Developing countries have a very high proportion of young people who are totally dependent on their families and parents for survival and support. This puts a tremendous strain on their parents as they try to provide education, food and health care to these people. On top of that housing and employment becomes a real problem.

Depletion of resources.

If the world population grows too large, the land may not be able to support it. Food supplies will be exhausted and the population will starve. The carrying capacity of the land will have been exceeded by the increasing size of the population. **Carrying capacity** is the maximum number of people with their needs and wants and other resources the land can sustain and carry at any one particular time. Over population and excessive use of resources disturbs the natural carrying capacity of the land.

People responded to the increasing population density, and a resulting overuse of farming and grazing lands in several ways. Some people moved to settle entirely new regions. Others devised ways of producing food in larger quantities and more quickly. The simplest way was to expand onto new fields for planting and new pastures to support growing herds of livestock. Many people also developed systems of irrigation and fertilization that allowed them to reuse cropland and to produce greater amounts of food on existing fields.

Green Revolution and hybrid crops.

The driving force toward the increased food production following World War II (1939-1945) was a result of a **new population explosion**. A so-called *green revolution*, involving selective breeding of traditional crops for high yields, new hybrids, and intensive cultivation methods adapted to the climates and cultural conditions of densely populated countries such as India temporarily reduced the pressure for more food.

A worldwide shortage of petroleum in the mid-1970s, however, reduced the supplies of nitrogen fertilizer essential for the success of the new varieties. Simultaneously, erratic weather and natural disasters such as drought and floods reduced crop levels throughout the world. Famine became common in many parts of Africa, especially south of the Sahara. Economic conditions, particularly uncontrolled inflation, threatened the food supplier and the consumer alike. These problems became the determinants of agricultural change and development.



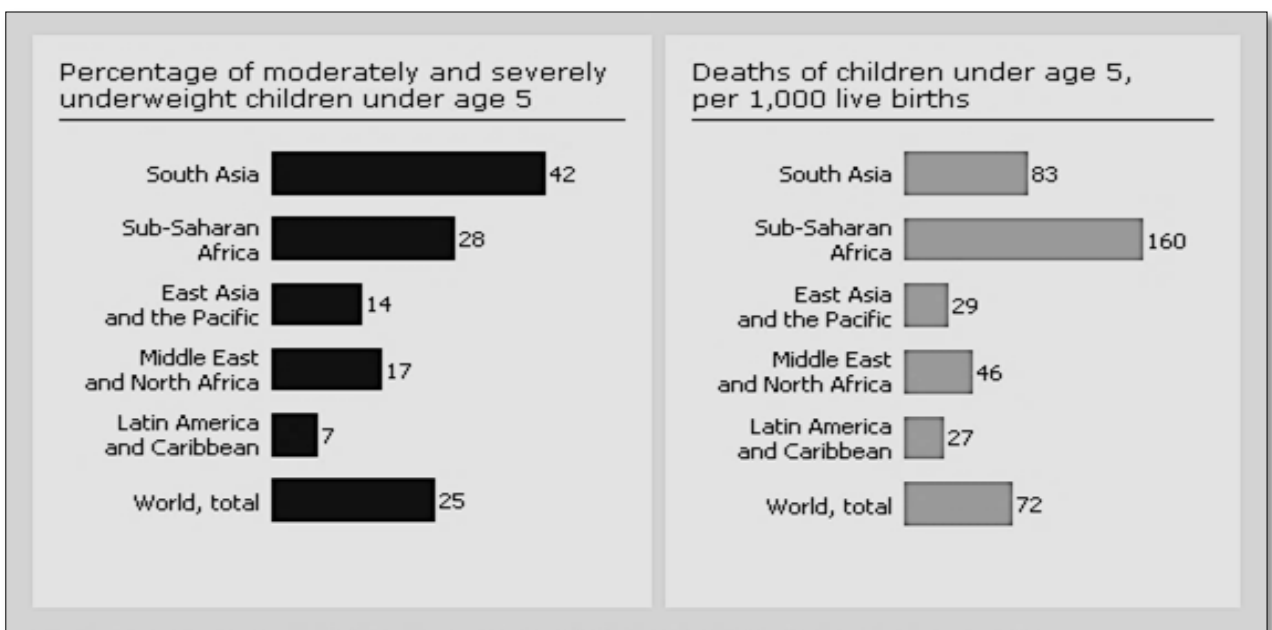
At the same time, industrial-scale agriculture has had adverse environmental consequences, such as intensive use of water, energy, and chemicals. Many aquifers and other water reservoirs are being drained faster than they can be renewed.

The energy required to produce nitrogen-based synthetic fertilizers, to operate heavy farm equipment, to manufacture pesticides, and to transport food over long distances involves burning large amounts of fossil fuels, which in turn contribute to air pollution and global warming. The use of synthetic fertilizers has affected the ability of soil to retain moisture, thus increasing the use of irrigation systems. Fertilizer runoff has also stimulated algae growth in water systems. Finally, herbicides and insecticides in many cases have contaminated ground and surface waters.

Malnutrition

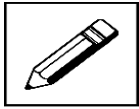
Malnutrition is one of the most common effects of poverty and overpopulation. In developing countries, the poorest people cannot obtain adequate calories to develop or maintain their appropriate body weight. In Ethiopia, for example, it is estimated that almost half of all children under the age of 5 suffer from malnutrition. Poor children in developing countries often suffer the most, commonly from a deficiency known as protein-energy malnutrition. In these cases, children lack protein in their diets as nutritious food items are expensive and hard to obtain.

Figure 27: Global Malnutrition.



Global Under nutrition in Children

Figure 27 above examine the problem of undernourishment in five geographic regions with developing economies. According to the World Health Organization, undernutrition contributes to an estimated one-third of the approximately 11 million deaths per year of children fewer than five years of age. Undernourished children lack strong immune systems and therefore, succumb to respiratory infections, measles, malaria, and other diseases.



Student Learning Activity 6

1. Describe the population structure of:

(a) Papua New Guinea

(b) England

2. Name three diseases that were the main cause of death in Papua New Guinea in 1984.

(a) _____

(b) _____

(c) _____

3. List three basic population control methods that can easily be adopted.

(a) _____

(b) _____

(c) _____

4. Briefly explain the “**One Child per Family**” policy of China.



5. Briefly describe the **Family Planning** process.

6. What is meant by the **carrying capacity** of the natural environment?

7. State two reasons why malnutrition is acute in developing nations.

CHECK YOUR ANSWERS AT THE END OF UNIT SUMMARY



11.4.3.0: Socio-Economic Issues Affecting Population

Poor and unhygienic living conditions, rising unemployment, overuse and depletion of natural resources, the rapid spread of infectious diseases amongst the poor and overcrowded, wide spread famine and acute shortage of food are just some of the obvious issues that affects population. Most of these issues prevail as a result of the uneven distribution of wealth and scarce resources.

War, political turmoil and instability have also affected the human population since time beginning. For example at the end of World War 2 about 55 million people died .This greatly affected population distribution in Europe, Asia and the Pacific where war was vigorously fought.

The prevalence of infectious diseases has also claimed the lives of humans in millions. Among the diseases that have occurred in epidemic proportions throughout history are bubonic plague, influenza, smallpox, typhoid fever, tuberculosis, cholera, bacterial meningitis, and diphtheria. Occasionally, childhood diseases such as mumps and German measles become epidemics.

Contemporary writers have called the **Bubonic Plague** or **Black Death** (which broke out in Europe in 1347 to 1351) “**a horrible and cruel thing**” because it seemed to them that the towns of Europe were nearly deserted in the aftermath of the plague. Overall, European population declined by about one-third. In many European cities population declined by up to 50 percent or more.

Today, HIV/AIDS and other infectious diseases like Ebola, TB, SARS, Malaria and Zika virus have grown so fast that in most parts of the world they have been officially declared as epidemics. Among those disease and pestilence, HIV/AIDS is now rated as the most fatal, biggest and fastest growing epidemic in the world . This chapter will discuss more about HIV /AIDS and its impacts on the human population.

Another issue that affects human population is the uneven distribution of scarce resources among the human population. People in the developed world consume more resources than those in the developing and poor countries. The gap between the rich and the poor widens and socio- economic disparity exists. More about socio-economic disparity will too be covered in this chapter.



11.4.3.1: Impacts of HIV/AIDS on Population Growth In Papua New Guinea:

What are HIV and AIDS ?

HIV stands for *Human Immunodeficiency Virus*. It is a virus which is only transmitted from person to person by sexual intercourse, sharing of needles or blood products or from mother to child during pregnancy, at birth or by breast feeding. Once the virus enters the body, it causes a slow and progressive collapse of the body immune system.

AIDS stands for *Aquired Immune Deficiency Syndrome*. It is the collapse of the body immune system. The HIV virus ravages the immune system completely and undermines the body's ability to defend itself from opportunistic infections from viruses, bacteria and fungi. The period between the initial infection of HIV and the development of AIDS is referred to as the **incubation period**. Window Period refers to the period of time that a person infected with HIV does not develop antibodies and remain healthy.

History of HIV/AIDS

The first publication about HIV/AIDS appeared in New York, Los Angeles and San Francisco in the United State of America in 1980 and in 1981 the first AIDS cases were reported in the same area. Since then the disease has rapidly spread to North and South America, Africa Europe, Asia, and Oceania. In Papua New Guinea HIV/AIDS was first detected and reported in Port Moresby in 1987 and by 2005 it had become a generalised epidemic. Today Papua New Guinea has a prevalence rate of 3 percent which is one of the highest in the Asia Pacific region.

Figure 28: *One of the first HIV/AIDS patients in Port Moresby General Hospital*





Cure and ART

Currently HIV/AIDS has no prescribed medication or cure. However a combination of drugs to inhibit and isolate the virus from multiplying has been produced and is currently available for consumption. It is called **ART** or **Anti-Retroviral Therapy**. ART treatment has become very popular in recent times because of its effectiveness in isolating the virus in the human body. The treatment can enable HIV/AIDS patients to live healthy lives for longer years. However ART does not kill the HIV/AIDS virus. ART treatment is now available in Papua New Guinea.

It is also important to mention here that sophisticated medical care and expensive drugs are only available in developed nations while most of the HIV/AIDS patients live in developing countries. Hence most of the HIV/AIDS sufferers do not have access to medical care and treatment. ART is also very expensive and only people with money can afford them.

Reducing the spread of HIV/AIDS

HIV/AIDS as an epidemic has the potential to spread and create havoc among the human population if it is not brought under control. However it is possible to introduce control measures which can be applied to reduce the spread of the virus and prevent it from becoming a worsening epidemic. Some of the measures include:

- (a) **Safe sex**- encouraging people to use contraceptives while having sex
- (b) **Legislation**- Enact laws to strictly control all forms of illegal and legal sex trade.
- (c) **Awareness and Education**- Awareness campaign to educate people about HIV/ AIDS
- (d) **Guidance and counselling**- to those infected and help them to access ART treatment
- (e) **Gender equality**- improves the status of women as they are vulnerable to the disease.

Figure 29: AIDS Awareness and Prevention Sign in Botswana, Africa



SOURCE: ENCARTA 2008

Impacts of AIDS in Papua New Guinea

For struggling economies of some developing nations such as Papua New Guinea, the potential repercussions of the epidemic include the slowing of national economic growth, lowering of gross domestic product (GDP), and lowering of human development.

However, the most severe impacts are felt at the household or family level where infections have caused serious social, financial and emotional stress.

**Lowering life expectancy**

According to figures released by the United Nations in 1999, AIDS has shortened the life expectancy in some Pacific nations by an average of seven years. In Papua New Guinea life expectancy for adults declined from 66 years in 1993 to 38 in 2003, according to the World Health Organization (WHO). The next few decades may see average life expectancy fall even lower in Papua New Guinea and the Pacific region.

Orphanage of Children

Hundreds of children in Papua New Guinea have been orphaned by the AIDS epidemic. Many children whose young parents died of AIDS are left to care for themselves and are forced on to the streets and orphanages as a result of discrimination and stigma. These children face poverty, a high risk of malnutrition and disease, and the absence of a family support structure.

Decline in economy

Today in Papua New Guinea, the disease has had a heavy impact on urban professionals, well-educated and skilled workers who played a critical role in the labour force of industries such as agriculture, education, transportation, and government have died at any early age or were forced in to early retirement which directly led to the decline in the skilled workforce and has damaged economic growth and productivity. Economists have warned of more disastrous consequences in the future. The country's total production of goods and services then declines.

Stigma and Discrimination in Papua New Guinea

As the extent of the epidemic unfolded, misinformation about AIDS and how it is transmitted triggered widespread fear of contracting the disease. Some communities responded with hysteria that resulted in violence. For example, in Chimbu Province three young girls who tested positive to HIV were forced into the Whagi River were all three drowned. Later their homes were torched by an arsonist. Today known HIV/AIDS patients are isolated and cut off from their family.

Violence and Gender inequality

In other communities, parents protested when HIV-infected children attended school. In many areas of the country, women in particular may face consequences if their HIV status is discovered. Reports indicate that many HIV-infected women are subject to domestic violence at the hands of their husbands—even if the husbands themselves are the source of infection. As a result, some women in developing nations fear being tested for HIV infection and cut themselves off from medical treatment.

Some of the women infected with the virus do not even seek guidance, counselling and even the current available ART treatment. They remain in isolation and eventually die.



11.4.3.2: Socio-Economic Inequality

Social or economic disparity exists between people and groups, or the condition or instance of being unequal exist between people or groups. The existence of this disparity is called socio-economic inequality. The fundamental concept or idea in socio-economic disparity is that, the distribution of scarce resources and wealth produced in a country, is unevenly distributed and shared among the people. Few people benefit so much and become filthy rich while majority of the people receive very little and become poor.

The reasons for such poverty are not clear. Some people believe that poverty results from a lack of adequate resources on a global level— resource such as land, food, and building materials—that are necessary for the well-being or survival of the world’s people. Others see poverty as an effect of the uneven distribution of resources around the world on an international or even regional scale. This second line of reasoning helps explain why many people have much more than they need to live in comfort, while many others do not have enough resources to live. However there are several appropriate socio-economic indicators which can be used to measure the degree of socio-economic inequality and these indicators are referred to as the **Human Development Index (HDI)**

Human Development Index

Socio- economic developments of a country and its people can be measured to find out whether inequality exists or not. There are many ways to measure development and inequality using a range of indicators known as the **Human Development Index** developed by the United Nations Development Program and combined indices on a country’s wealth, health and education. The indices are:

- Gross National Product (GNP)
- Infant Mortality Rate
- Population Growth Rate (%)
- Adult Literacy Rate (%)
- Urban Population (%)
- Daily per capita calorie supply (%)
- Excess to health care (%)

Gross National Product

Gross National Product (GNP), is a term used in economics to describe in monetary value the total annual flow of goods and services in the economy of a nation. The GNP is normally measured by totalling all personal spending, all government spending, and all investment spending by a nation's industry both domestically and all over the world. Most industrialized countries, including the United States, now use the gross domestic product (GDP) as their chief economic indicator. The GDP measures the value of all goods and services produced within a nation's borders regardless of the nationality of the producer.



Infant Mortality Rate

Term used to describe the number of infant death under one year per 1000 live births per year. High infant mortality rates indicate lack of access to health facilities and proper nutrition. It further indicate poor living conditions.

Population Growth Rate

The percentage by which a country’s population is growing. Developed and rich nations have a low population growth rate. Poor and developing nations have a high population growth rate. Sometimes growth rate is referred to as natural increase

Adult Literacy rate

The percentage of persons aged above 15 and over who can read and write is referred to as adult literacy rate. Developed nation have a very high literacy rate while the majority of people in developing nations are illiterate. The data given below (**figure 30**) shows that adult literacy rate is high in developed nations compared to developing nations.

Figure 30: Development Statistics for Selected countries

Country	GNP \$US	Population Growth %	Infant Mortality rate	Adult Literacy Rate %	Urban Population %	Daily Calorie %	% of population that access health service
PNG	1160	3	63	52	15	114	96
Australia	17980	0.8	5.8	99	85	124	100
Indonesia	880	1.6	66	82	31	121	80
Nigeria	280	3.1	87	51	16	93	66
China	530	1.1	44	78	29	112	90
USA	25860	0.6	7.5	99	75	138	100
Mexico	4010	2.2	34	88	71	131	78
Brazil	3370	1.7	58	82	76	114	n/a
Sweden	23630	0.1	4.4	99	83	111	100
Peru	1890	2.1	60	85	70	87	75
Ethiopia	130	3.1	120	24	15	73	46
Ghana	430	3	66	60	36	93	60
Russia	2650	-0.5	18	99	73	n/a	n/a
Mali	250	3.1	106	32	26	96	n/a
Latvia	2290	-0.7	19	99	69	n/a	n/a
UK	18410	0.2	6.2	99	90	130	100
Japan	34630	0.2	4.2	99	78	125	100
India	310	1.9	79	48	26	101	85
Italy	19270	0	83	97	97	139	100
Iran	2230	2.9	57	54	58	125	80
Industrialised Nations	18130	0.6	9	98	76	134	100
Developing Countries	918	2.1	69	66	36	107	79
Least Developed nations	236	2.7	111	43	22	90	48



Urban Population

The percentage of people living and working in urban areas varies. In industrialised and developed nations 76% of their total population live in urban areas while 36% of people in developing nations and 22% of people in least developed nations live and work in urban areas. (Refer to figure 30). This further indicates that majority of the people in developing and least developed nations live and work in rural areas.

Daily per Capita Calorie supply

Daily per Capita Calorie Supply is the daily food supply as a percentage of the required food supply for each country. Food is a very important basic need. Most people in developing nations do not have access to quality nutritious food. People in industrialised nations consumed more food than people in developing and least developed nations. (Refer to figure 30)

Access to Health Care

Access to Health Care refers to the percentage of the population with access to decent health care services. Most people living in rural areas in developing countries do not have easy access to proper medical care.

Disparity in Papua New Guinea.

From the table (figure 28) it is clear that socio-economic inequality is prevalent in Papua New Guinea. First the country has a very high population growth rate of 3 per cent. Most of this growing population live in very poor and impoverish conditions in rural areas. This can further be confirmed by the very high infant mortality rate as indicated on the table

Other Indicators

Papua New Guinea is a country endowed with so many natural resources yet today it has three distinct groups of people or class of people, the minority who are rich and powerful, the middle income earners and the majority, consisting of poor and common people.

The **minority rich** people include politicians, businessmen and some public servants who have access to the means in which they can acquire wealth very fast through corrupt and dubious deals and enjoy a very luxury life. They have access to private health care facilities and send their children to attain education in overseas schools especially in Australia and the Philippines.

The **middle income earners** are the working class people of the country. Most of them work only to sustain their daily living. Because of the rising cost of living they are not able to save a portion of their earnings. Only a few in this category become rich. Most remain in this category or fall to the poor category.

The **majority poor** people of this country's population are illiterate subsistent farmers scattered in rural areas across the width and breadth of this country. They live and work in very poor conditions below the absolute poverty line. Most of these poor people do not have access to proper health care, education and other basic development needs. As a result most of these poor people are beginning to migrate to urban areas in search of a better life.



The gap between the rich and the poor in this country is widening. Average income levels for the people in the rural areas are far too low.

Uneven distribution of Wealth

To minimise this disparity the government of Papua New Guinea needs to plan properly and distribute the country's wealth and resources evenly. Basic services like health, education and transported facilities must be built in rural areas across the nation. Create incentives and markets for rural farmers to sell their produce and link all rural areas with appropriate transport network so that goods and services can flow freely between the rural and urban areas. Currently the country's resources are not evenly distributed among the people.

Housing woes in urban areas

Because there is limited housing and other infrastructure in urban areas, rural-to-urban migrants have created squatter settlements on the periphery of towns and cities. In Port Moresby, these settlements contain as much as half the city's total population. They are generally cramped and lack adequate sanitation facilities. Today most of the middle working class people who cannot afford decent accommodation in the city live in the settlements. Only the rich can afford decent accommodation in the city centres.

Unemployment and underemployment

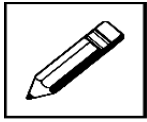
Unemployment and underemployment are high, which further aggravates the situation. The crime rate is also high, and incidences of violent crime have increased significantly since the 1980s. Intertribal and ethnic violence also sometimes occurs frequently.

Low status of women

In Papua New Guinea women still have low social status. Most women do not have access to both education and income-generating work. Without adequate income, most are forced to marry quickly so that they can depend on men for financial and moral support. In other developing nation especially in South East Asia women seeking to work or emigrate to other places are tricked and sold into prostitution or indentured servitude. They receive little or no pay, and are forced to stay to pay off debts incurred through their emigration. Many women end up in sweatshops—illegal factories and nightclubs.

Overall impact on the economy.

The gap between the rich and the poor widens. Rich people consume more resources but do not contribute much to the development of the economy. The poor and ordinary people consume fewer resources but contribute so much to the development of the economy. A country cannot achieve much economic growth if the bulk of its population are illiterate and poor and live and work in impoverished conditions. This greatly affects gross national product (GNP) and slows down economic growth and productivity. In developed countries poverty and changes in labour markets can directly be linked to economic trends and disparity.



Student Learning Activity 7

1. What do the following abbreviations stand for?
 - (a) HIV _____
 - (b) AIDS _____

2. List three ways in which the HIV/AIDS virus can be transmitted between persons.
 - (a) _____
 - (b) _____
 - (c) _____

3. If the HIV/AIDS virus is not controlled what would be the effect on the human population

4. Describe the effects HIV/AIDS would have on a country's economy

5. List all the **Human development indices**

CHECK YOUR ANSWERS AT THE END OF THE UNIT SUMMARY



UNIT SUMMARY

- Population is the number of people that dwell in a place at any one particular time. As time goes by this population can increase or decrease depending on the number of births deaths and migration that is taking place. Scientists sometimes use the word population to talk about the number of animals, plants, or other living things. But most of the time, population refers to human beings. Knowing about the population helps people plan for infrastructure development
- The human population over time cannot remain the same; it will increase as a result of low death rates, high birth rates and more immigration. The population will grow and change if more people are born than die or migrate. If more people die and migrate than born the population will also change but this time decrease. The increase or decrease in population is referred to as **population change**.
- Today the world total population is well over 10 billion people. It has been accurately predicted that in the next century the population will increase by between fifteen and twenty billion people depending on how birth rates can be reduced to replacement levels.
- **Population Change is controlled by the three factors of birth, death and migration.**
- However it is believed that the first humans appeared on this planet about 25 million years ago and it took about two million years for the population to reach 250 million people by about 2000 years ago. Then 1000 years ago the population increased to 275 million. Today the world population stands at more than 10 billion people.
- The greatest increase occurred in the 1900 AD. In that century alone the increase in population has been so great that it has been called the “**Population Explosion**”. The main cause of the of the population explosion was the rapid lowering of the death rate and infant mortality rate due to advance developments in medicine, nutrition, health and agriculture during the industrial and agricultural revolution in Europe. People lived longer years until old age and more babies born lived well over the first year of their life.
- As of the year 2000, 1.2 billion people lived in the developed nations of the world, and 4.9 billion people lived in the less-developed countries. By region, over half the world's population was in East and South Asia; China, with 1.3 billion inhabitants, and India, with some 1 billion, were the dominant contributors. Europe and the countries of the former USSR contained 14 percent, North and South America made up 14 percent, Africa had 13 per cent, and the Pacific Islands had about 1 percent of world population.
- **Birth Rate** ---- is the total number of babies born into a population of 1000 every year.
- **Death Rate** ----- is the number of deaths in a population of 1000 every year. Again in 1980 there were twenty five deaths for every 1000 people in 1980 for Nigeria. There were 25 more births in Nigeria than deaths. This is called the **rate of natural**



increase. The rate of natural increase takes place when there are more births than deaths.

- **Infant mortality rate** refers to the number babies born but died in the first year of their life, usually stated as a number per 1,000 births. Many less-developed countries have infant mortality rates above 100 per 1,000—that is, more than 10 percent of the children die in their first year. In countries with effective health and educational systems, infant mortality rates are about 15 per 1,000, or even lower.
- **Fertility rate** refers to the frequency or numbers of live births a woman can actually have during her reproductive life if she experienced the fertility rate at each age. This does not include women who have the potential to give birth but do not do so due to reasons only known to themselves. An alternative word for this meaning the capacity for reproduction is called the Fecundity rate.
- **The population pyramid** shows the proportion of males and females at 5 year age intervals. From the population pyramid it can be determined whether the population is growing, stable or likely to decline. As a country moves through each stage in the demographic transition model the shape of the population pyramid changes.
- **The population pyramid** also clearly indicates the dependency load of a country. Dependency load is primarily the number of older people and younger people in the population who depend entirely on other people and who are not part of the work force. The people who are unemployed are also included in this category.
- **The demographic transition model** is a method which is used to show what might happen and what will happen to a population's birth rate, death rate and natural increase in time. This model is good for describing changes in Europe but it is not appropriate for developing and poor third world countries and other less economically developed countries.
- **Migration** is the movement of people, especially of whole groups or individuals from one place, region, or country to another, particularly with the intention of settling permanently. Human migration can be seasonal or periodic depending on the factor that causes the people to migrate.
- **Migration** is usually about permanent change of home but temporary movement of people such as the seasonal movement of nomadic people can also be referred to as migration.
- **Migration** can be voluntary or forced. **Voluntary migration** occurs when people move freely by choice without any form of undue influence. **Forced migration** occurs when people are forced to migrate against their will.
- **Papua New Guinea** as a developing nation has a population that is characterised by a very high birth rate and a very large number of young population and a very high death rate. This is indicated by a very wider pyramid base and decreasing steps



upwards as shown on the pyramid below. Papua New Guinea is in the second stage (early expanding stage) of the demographic transition model.

- **A policy** is a program of actions adopted by a person, group or organisation to achieve desired goals and objectives. Government population policies seek to contribute to national development and welfare goals through measures that, directly or indirectly, aim to influence demographic processes—in particular, fertility and migration. In most cases governments population policies mainly aim to effectively minimise population growth rate so that the country's limited resources and wealth can be conservatively used and fairly distributed.
- After independence the government of Papua New Guinea did not have any concrete and specific population plan and policy in place. Even today at the time of the writing of this material several law and policy making government agencies were consulted but not even one was able to produce a draft policy on population growth management and control in the country. This is bad for a country that is experiencing a population explosion this decade. However, it is believed that the current government is working on a draft population policy which will be tabled in Parliament soon to be debated upon and be made in to law. Once this is in place then Papua New Guinea will have a clear population growth control policy in place. Its weaknesses and strength can then be identified and criticized.
- If the world population grows too large the land may not be able to support it. Food supplies will be exhausted and the population will starve. The carrying capacity of the land will have been exceeded by the increasing size of the population. Carrying capacity refers to the maximum number of people and other resources the land can sustain and carry at any one particular time. Over population and excessive use of resources disturbs the natural carrying capacity of the land.
- **Malnutrition** is one of the most common effects of poverty and overpopulation. In developing countries, the poorest people cannot obtain adequate calories to develop or maintain their appropriate body weight.
- Poor and unhygienic living conditions, rising unemployment, overuse and depletion of natural resources, uneven distribution of wealth and scarce resources, rapid spread of infectious diseases ,wide spread famine and acute shortage of food are just some of the obvious issues that affects population.
- The **human immunodeficiency viruses' (HIV)** has been detected in the 1970s and since then the viruses has rapidly spread among the human population in Papua New Guinea
- **HIV** can be transmitted through unprotected sex, contact with contaminated blood, tissue, or needles and from mother to child during pregnancy, at birth or during breastfeeding.
- **Social or economic disparity exists** between people and groups, or the condition or instance of being unequal exist between people or groups. The existence of this disparity can be referred to as socio –economic inequality. The fundamental concept



or idea in socio-economic disparity is that when it comes to the distribution of scarce resources and wealth produced in a country, it is unevenly distributed and shared among the people. Few people benefit so much and become filthy rich while majority of the people receive very little and become poor.

- Socio-economic developments of a country and its people can be measured to find out whether inequality exists or not. There are many ways to measure development and inequality using a range of indicators known as the **Human Development Index** developed by the United Nations Development Program and combined indices on a country's wealth, health and education. The indices are
 - GNP Gross National Product
 - Infant Mortality Rate
 - Population Growth Rate (%)
 - Adult Literacy Rate (%)
 - Urban Population (%)
 - Daily per capita calorie supply (%)
 - Excess to health care (%)



ANSWERS TO LEARNING ACTIVITIES

Answers to Learning Activity 1

- China—139 people per square kilometer
 - Russia—8 people per square kilometer
 - Indonesia—1253 people per square kilometer
 - USA—31 people per square kilometer
- (a) Canada (b) Australia (c) Russian
 - (a) Japan (b) India
- (a) South East Asia (b) Subcontinent of India (c) Europe
- Choropleth map is used to show population density distribution
Dot map is used to show relative spread of population.
- Where the population density is very high and people are crowded together disease can spread fast and become epidemic
- The environment with its resources gets depleted very fast

Answers to Learning Activity 2

FACTORS	SPARSELY POPULATED AREAS	MODERATELY POPULATED AREAS	DENSELY POPULATED AREAS
Climate	Receiving very low rainfall Very hot / cold temperature eg: Sahara, Greenland	Receiving moderate rain Moderate temperatures E.g.: Central Australia	High rainfall all year round. Average temperatures all year.
Relief/Soil Fertility	Soils infertile, rugged and unsuitable	Soils only suitable for certain crops	Very fertile plains and valleys
Vegetation/ animal life	Very few species of plant and animal species	Few services and transport links	Abundant plant and animal life
accessibility	Transport network not connected. Isolated and cut off from basic services.	Have access to few transport routes	Effective transport network connected
Water supply	No clean water supply	Scarcity of clean water supply	Controlled water supply distributed to population
Energy resources	No electricity or sources of power	Few places connected to electricity	Access to electricity and other power supply
Mineral resources	Several mining activities	few mining activities	Agricultural activities and less mining activities.



Answers to Learning Activity 3

1. (a) 35 years

(b) 23 years

(c) 18 years

(d) 14 years

2. Completed table.

	Country	Birth Rate	Death Rate	Natural Increase
1	Australia	14	7	7
2	Brazil	25	8	17
3	China	17	7	10
4	Ethiopia	46	16	30
5	Italy	9	10	-1*
6	India	29	10	19
7	Indonesia	24	8	16
8	Japan	10	7	3
9	Mexico	27	5	22
10	Nigeria	50	25	25
11	Canada	11	9	2
12	Russia	9	15	-6*
13	Saudi Arabia	36	4	32
14	Sweden	12	11	1
15	USA	15	9	6



Answers to Learning Activity 4

1. Completed table on the five stages of the demographic transition model

Stages	Births	Deaths	Other features
High Stationary Stage	High birth rate	High death rate	Common in countries like Sudan and Somalia
Early Expanding Stage	High birth rate	Death rate falls	Common in Fiji, Nigeria, PNG
Late Expanding Stage	High birth rate	Death rate continues to fall	Common in USA, Australia
Low Stationary Stage	Birth rate levels off	Death rate remains low	Common in Germany, Israel and England
Declining Stage	Low birth rate	Death rate increases	Common in Sweden, Austria and Norway.

2. Because the model is good for describing changes in Europe but is not appropriate economically to less developed countries.

Answers to Learning Activity 5

1. Migration is the movement of people as individuals or in groups from their place of birth and original residence to another new location with the intension of settling in the new location.

2. (a) Internal migration refers to the movement of people within a country
External migration is the movement of people between countries.
(b) In voluntary migration people move by choice and without any undue influence whereas in forced migration people are forced to migrate because of some unfavourable conditions.

3. If more people emigrate out of a country then its total population will decrease.



4. Examples of push factors are (a) war, (b) famine, (c) disease /epidemic.
5. Squatter Settlements grow rapidly in towns and cities in Papua New Guinea as direct consequences of Rural- Urban Drift where most of the people in rural areas move to urban areas in search of better life.

Answers to Learning Activity 6

1. **England's population structure:** Low birth rate, low death rate, high dependency load of elderly people, longer life expectancy and low population growth.

Papua New Guineas Population Structure: High birth rate, high death rate, high dependency load of young people, short life expectancy and rapid growing population.

2. (a) malaria, (b) pneumonia ,(c) TB /tuberculosis.
3. (a) Family planning, (b) economic development, (c) socio-economic change.
4. **One child per family policy** was introduced by the Chinese government to control and minimize the rapid population growth in the country. It became law and all married couples were obliged to have only one child. Under the law second and third child born were considered illegal.
5. **Family planning programs** provide educational and clinical services to help married couples choose the number of children they want to have. Such programs can reduce a country's population growth rate faster than waiting for the demographic transition to take place.
6. **Carrying capacity** refers to the maximum number of people and other resources the land can sustain and carry at any one particular time. Over population and excessive use of resources disturbs the natural carrying capacity of the land.
7. (a) Malnutrition can be caused by poverty, famine, war and natural disasters
(b) Malnutrition can be caused by over population and uneven distribution of resources

Answers to Learning Activity 7

- 1 (a) HIV stands for **Human Immunodeficiency Virus**.
(b) AIDS stands for **Acquired Immunodeficiency Syndrome**.
2. (a) sexual intercourse (b) Blood Transfusion (c) mother to baby during pregnancy.



3. AIDS as an epidemic has the potential to decimate the human population if it is not brought under control.
4. AIDS can cause a country's economy to decline or paralyze production by killing young educated and skilled people in the work force.
5. Human development index
 - GNP Gross National Product
 - Infant Mortality Rate
 - Population Growth Rate (%)
 - Adult Literacy Rate (%)
 - Urban Population (%)
 - Daily per capita calorie supply (%)
 - Excess to health care (%)



GLOSSARY

Accessibility – able to obtain and use without difficulty

Adult Literacy Rate-- percentage of persons above the age of 15 who are able to read and write.

AIDS—Acquired Immune Deficiency Syndrome

ART—Ant-Retroviral Therapy

Birth Rates—The number of live births per 1000 people per year.

Black Death—Refers to the Bubonic plague which broke out in Europe between 1347 and 1351.

Bulge-- any part of a population pyramid that curve outward indicating increase in population.

Carrying Capacity-- maximum number of people and their needs and wants the land can sustain at any one time.

Choropleth Map—map which is used to show population density.

Crude Rates—Statistics about the general population such as births and deaths per 1000 people.

Death Rates--- Number of deaths per 1000 people per year.

Demographic Time Bomb— rapid increase in world population growth.

Demographic Transition Model— Model which is used to show what might happen and what will happen to a population's birth rate and death rate and natural increase in time.

Densely Populated— people living close together in a given area at any one particular time.

Dependency Ratio—number of older and younger people in the population who are dependents.

Dip – any part of the population pyramid that curve inward and indicate a decrease in population.

Disparity- absence or lack of equality that exist between people and groups of people.

Dot Map—-map used to represent or show population distribution.



Doubling Time—the time (number of years) taken for a population to double.

Emigration—people moving out of their country of birth to live elsewhere.

Family Planning—Programs provided to help married couples choose the number of children they want to have.

Fecundity Rate—Women who have potential to give birth but do not do so for reasons only known to themselves.

Gross National Product—in monetary value the total annual flow of goods and services in the economy of a nation.

HIV—Human immunodeficiency Virus.

Human Development Index—indicators used to measure development and inequality.

Immigration—people moving in to a country to reside.

Incubation Period-- The period between the initial infection of HIV and the development of AIDS.

Legislation—the process of writing and passing law.

Life Expectancy—the total number of years a person is expected to live.

Malnutrition—diet conditions caused by a deficiency or excess of one or more essential nutrients in the diet. Malnutrition is characterized by a wide array of health problems, including extreme weight loss, stunted growth, weakened resistance to infection, and impairment of intellect. Severe cases of malnutrition can lead to death.

Orphanage—Institutions that care for children who have no parents.

Policy –program of actions adopted by a person, group or government once implemented would achieve desired goals and objectives.

Population-- number of people in a given area at any one time.

Population Density-- is the measure of the number of people living within a defined area of land at any one particular. It is usually expressed as persons per square kilometre.

Population Distribution-- The relative spread of the human population on the surface of this earth.

Push Factors— Unpleasant conditions that forces people to migrate out of that area.



Refine Rates – Vital statistics about a specific segment of the population like number of births and deaths per 1000 people in a particular age group, gender or country's population.

Replacement Levels—fertility level at which each person on average has a single successor.

Sparsely Populated--in a given area less people live far apart, have access to more space and other basic needs like food and water.

Stigma and discrimination—unfair treatment given to HIV/AIDS infected people through prejudice.

Urban Population—the portion of a country's population that live in urban areas.

Window Period---the period of time that a person infected with HIV does not develop antibodies and remain healthy.



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**SUBJECT AND GRADE TO STUDY**

GRADE LEVELS	SUBJECTS/COURSES
Grades 7 and 8	1. English
	2. Mathematics
	3. Personal Development
	4. Social Science
	5. Science
	6. Making a Living
Grades 9 and 10	1. English
	2. Mathematics
	3. Personal Development
	4. Science
	5. Social Science
	6. Business Studies
	7. Design and Technology- Computing
Grades 11 and 12	1. English – Applied English/Language & Literature
	2. Mathematics - Mathematics A / Mathematics B
	3. Science – Biology/Chemistry/Physics
	4. Social Science – History/Geography/Economics
	5. Personal Development
	6. Business Studies
	7. Information & Communication Technology

REMEMBER:

- For Grades 7 and 8, you are required to do all six (6) courses.
- For Grades 9 and 10, you must study English, Mathematics, Science, Personal Development, Social Science and Commerce. Design and Technology-Computing is optional.
- For Grades 11 and 12, you are required to complete seven (7) out of thirteen (13) courses to be certified.

Your Provincial Coordinator or Supervisor will give you more information regarding each

GRADES 11 & 12 COURSE PROGRAMMES

No	Science	Humanities	Business
1	Applied English	Language & Literature	Language & Literature/Applied English
2	Mathematics A/B	Mathematics A/B	Mathematics A/B
3	Personal Development	Personal Development	Personal Development
4	Biology	Biology/Physics/Chemistry	Biology/Physics/Chemistry
5	Chemistry/ Physics	Geography	Economics/Geography/History
6	Geography/History/Economics	History / Economics	Business Studies
7	ICT	ICT	ICT



Notes: You must seek advice from your Provincial Coordinator regarding the recommended courses in each stream. Options should be discussed carefully before choosing the stream when enrolling into Grade 11. FODE will certify for the successful completion of seven subjects in Grade 12.

CERTIFICATE IN MATRICULATION STUDIES		
No	Compulsory Courses	Optional Courses
1	English 1	Science Stream: Biology, Chemistry, Physics
2	English 2	Social Science Stream: Geography, Intro to Economics and Asia and the Modern World
3	Mathematics 1	
4	Mathematics 2	
5	History of Science & Technology	

REMEMBER:

You must successfully complete 8 courses: 5 compulsory and 3 optional.