Measures of Population Change

Demographic measures are the actual changes in size, composition and distribution due to changes in demographic components like birth, death and migration, as a result of their respective processes like rate of fertility, mortality and migration. Demographic measures are enumerated by applying specific formulas for a specific type of measurement.

Fertility Rate

Fertility refers to the reproductive function. It is the ability to bear offspring. It is the production of live birth which starts when a woman gives the first birth. Its period is generally 15-49 years of age. Likewise, fecundity is the psychological capacity to participate in reproduction. It starts with the regulation of monthly menstrual cycle. Fertility results in a birth. It is measured by the actual number of births. The measures that are used to estimate fertility rate are as follows: -

1. Crude Birth Rate(CBR)

Crude Birth Rate is the simplest way of measuring fertility. The crude birth rate of an area is defined as the number of live births occurring in that area, in a given period of time, usually a year, divided by the total population of that area as estimated in the middle of the year. The rate is expressed in terms of 'per 1000 of the population'.

2. Age-Specific Fertility Rate(ASFR)

Fertility rates may be computed for each age from 15-49 years. However, computation of each year may not be necessary, generally fertility rates for five-year age groups are measured. Such fertility rates are known as age-specific fertility rate.

3. Total Fertility Rate(TFR)

Total fertility rate is referred to the number of children of women, would bear during her childbearing age under ongoing age-specific fertility rate (ASFR). It is measured as the sum of age-specific fertility rates calculated for the same single year. Since, the ASFR is calculated for 5 year age groups, the sum of ASFR's need to be multiplied by 5.

Measures of Mortality and Migration

Measures of Mortality

Death rate refers to the decrease in the size of the population. A declining death rate due to the modern scientific heath services and a constant birth rate have been the major causes of rapid population growth in Nepal.

The measures that are commonly used to estimate mortality rates are as follows: -

1. Crude Death Rate (CDR)
2. Infant Mortality Rate (IMR)

1. Crude Death Rate(CDR)

Crude Death Rate is a simple measure of mortality. It gives the number of deaths occurring in a given population during a specified year per 1000 of the population at mid-year.

2. Infant Mortality Rate(IMR)

Infants are considered as the age group of 0-1-year-old. IMR measures the mortality rate prior to the age below one. The infant mortality rate is calculated as follows: -

Measures of Migration

Migration is another process of demography and deals with the change in the size and composition of the population by migrating from one place to another. There are two types of migration. They are national and international migration. In both of these migrations, there are two ways of the flow of population inflow and outflow. People who flow-in from another place or country are called immigrants and those who flow out from their native place or country are emigrants.

Various measures of migration are as follows: -

1. In-Migration Rate
2. Out-Migration Rate

1. In-Migration Rate

In-Migration rate deals with the people coming into a place or a country.

2. Out-Migration Rate

Out-Migration rate deals with the people leaving the place of origin within or outside the country.

Demographic Component

Population change results from the interaction of demographic components: birth, death and migration. Therefore, demography deals with the detailed study of the three components. With the measurement of such components, various aspects of the population are analyzed and interpreted. It helps to plan and implement various development activities. Birth, death and migration are called demographic component, as well as the determining elements of population change because they affect the situation of the population. Therefore, the size of the population depends mainly upon birth, death and migration.

Fertility

Birth is an important component mainly related to fertility in the study of population education. Fertility deals with the birth. The population growth of a place/country depends upon fertility because the country with high level of fertility has a rapid growth of population. Fertility refers to the reproductive function. It is the ability to bear offspring. It is the production of live birth which starts when a woman gives the first birth. Its period is generally 15-49 years of age. Likewise, fecundity is the physical capacity to participate in reproduction. It starts with the regulation of monthly menstrual cycle. Fertility results in the birth. It is measured by the actual number of births.

Mortality

According to WHO, "Death is the permanent disappearance of all evidence of life at any time after birth has taken place." It is a natural process. The process of birth and death goes on incessantly. People die at different ages for different reasons. People die of different diseases and in several accidents. This is a perpetual process. This process causes the decline in population.

Migration

Migration means the movements of people from place to place. The movement of people inside the country is called national migration like Bhaktapur to Kathmandu. And the movement of people from one country to another is called international migration like Nepal to China.

The people who shift from the original place are called out-migrants and those people who live in their destination called in-migrants. In the same way, people who shift from one country to another are called emigrants for departure and immigrants for the destination. The difference in the number of people due to immigration and emigration in a country is called gross migration.

Population Composition in Nepal

There are various factors that affect the population. On the basis of those factors, the population of any area or country can be divided into various groups. They are studied as population structure. The population can be studied on the basis of caste, gender, literacy rate, occupation, mother tongue, age, qualification, etc. helps to determine the population of any place. People of six years of age and above are included in the literacy rate of Nepal. The literacy rate of Nepal is presented in the following table: -

Literacy rate (in percent)

	Nepal				Urban Areas			Rural areas		
Years	2038	2048	2058	2068	2038	2048	2058	2038	2048	2058
Both gender	23.3	39.6	54.1	65.9	56.0	66.4	71.9	21.3	36.8	51.0
Male	34.0	54.4	65.5	75.1	66.0	77.4	81.2	32.0	51.9	62.6
Female	12.0	25.0	42.8	57.4	44.0	54.3	61.9	10.3	22.0	39.6

Source: Census, 2068

Population and occupation

The population of any place or country can be divided into various groups on the basis of occupation. The population in accordance to the occupation is presented below: -

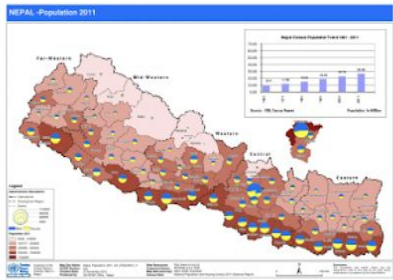**Population distribution on the basis of occupation**

Occupation	Population (in percent)		
Years	2038	2048	2058
Agriculture	91.37	81.10	59.61
Non-agriculture	6.35	18.62	40.47
Others	2.28	0.28	0.08

Urban areas

Agriculture	63.7	23.8	38.16
Non-agriculture	26.4	75.6	61.74
Others	9.9	0.6	0.10

Source: CBS, 2050 and 2060

Distribution of Population in Nepal

The arrangement or spread of people living in a given area; also how the population of an area is arranged according to variables such as age, sex, race, etc. is called distribution of the population. Physical areas, development areas, zones, districts including urban and rural areas are the basis for the distribution of the population. The number of municipalities is increasing nowadays. People are migrating from rural to urban areas or municipality areas nowadays. The distribution of population in rural and urban areas is presented below: -

Population distribution in rural and urban areas (in percent)

Years	Rural areas	Urban areas	Himalayan	Hill	Terai
2048	90.49	9.51	7.8	45.5	46.7
2058	85.8	14.2	7.3	44.4	48.4
2068	82.93	17.07	6.73	43.0	50.27

Source: Central Bureau of Statistics

The population of urban areas of Nepal is increasing rapidly in comparison to rural areas. This shows that the people are migrating towards urban areas. After the increment in number of the municipality, the population of rural areas is decreasing and the population of urban areas is increasing.

There are five development regions in Nepal. The population distribution in accordance with the development regions is presented below in a table: -

Population distribution on the basis of development regions

Development Regions (DR)	Population (in percent)				
Years →	2028	2038	2048	2058	2068
Eastern Development Region	24.21	24.69	24.0	23.08	21.93
Central Development Region	33.45	32.68	33.5	34.69	36.45
Western Development Region	21.17	20.83	20.4	19.74	18.60
Mid- Western Development Region	12.88	13.02	13.0	13.01	13.39
Far- Western Development Region	8.29	8.72	9.1	9.47	9.63

Source: Ministry of Health and Population 2068 and CBS, 2069

Among all the development regions, Central Development Region has the highest population. According to the statistics of 2068 BS, the total population of this development region is 96,56,985. This has represented 36.45% of all population of Nepal. Eastern Development Region is in second number. Far-Western Development Region has the lowest population of all. Western, Mid-Western and Far- Western Development Regions have 18.6%, 13,39% and 9.63% of the population of Nepal respectively. After 2028 BS, we can find that the population of Central and Far- Western Development Region are increasing rapidly whereas the population of Eastern and Western Development Regions are decreasing.

Internal and External Migration in Nepal

Internal Migration

Simply, internal migration refers to the movement of people within a country. So, internal migration can be defined as the human migration within one geopolitical entity, usually a nation. The reasons for internal migration are often educational or economic. A general trend of migration from rural to urban areas has also produced a form of internal migration, leading to rapid urbanization in many countries like Nepal. People of Nepal are migrating from mountains and hills to Terai and urban areas. According to the statistics of 2068, the Terai region of Nepal, covers more than 50% of the total population of Nepal. The main reason for this is the migration of people from mountains and hills to Terai. The main reasons for the increment in the population of Terai region are the attractions and facilities of trade, agriculture, employment etc.

International Migration

Simply, the movement of people from one country to another is called international migration. So, external migration refers to change of residence over national boundaries. External migration takes place for educational or economic reasons as well, but often, it is politically motivated. An international migrant is someone who moves to a different country.

Number of people migrated out in a year

Reasons	Number of Persons	Percent (%)
Agriculture	7763	1.02
Trade	12060	1.58
Self-service	506221	66.42
Organizational-service	94329	12.38
Education/training	31727	4.17
Marriage	14101	1.85
Others	95970	12.69
Total	762181	100.00

Source: Central Bureau of Statistics, 2003

Demography

John Grount initiated the study of demography based on his work 'Natural and Political Observation Made upon the Bills of Mortality' in 1662. Therefore, he was considered as the Father of Demography. However the word 'demography' was first coined by Achille Guillard in his book Comparative Demography published in 1855.

The word demography is derived from two Greek words 'demos' and 'graphien'. Demos means people whereas graphien means to study. So, in simple words we can say that demography is the study of human population. Demography is the systematic and scientific study of the human population primarily with respect to size, structure, distribution and change (development).

Population change results from the interaction of demographic components, viz, birth, death and migration. Therefore, demography deals with the detailed study of the three components. With the measurement of such components, various aspects of the population are analyzed and interpreted. It helps to plan and implement various development activities.

Components of Demography

1. **Major Demographic Processes: -** This includes fertility, mortality and migration.
2. **Population Statistics: -** Population statistics helps to study birth rate, death rate, migration rate, population distribution, etc. of any place, district, region, zone or a country.
3. **Population Distribution: -** The population distribution of any area has a particular pattern. Some places or region may have more population whereas some places or region may have less population. For example, the Terai region of Nepal has more population than Himalayan and hilly region of Nepal.
4. **Causes of Population Growth: -** The causes of population growth are the major part of demography. The measures for the adverse effects caused by the population growth could be adopted only after knowing the causes of it.
5. **Consequences of Population Growth: -** The population growth has created many problems in the world. Food, health, employment opportunities, education, housing, entertainment, etc. are affected due to rapid population growth.
6. **Sexual and Reproductive Health: -** Physical structure of human and fecundity, contraceptives devices, subject matters related to sex, etc. come under sexual and reproductive health.
7. **Population Policies and Programmes: -** Population policies and programmes are also the major part of demography.Every country has its own population policies and programmes.

Population Growth Rate and World Population

The world's population has crossed 7 Arab in 2011 AD. In 1 AD, the total population of the world was 250 million, i.e. 25 crore only. The world population took about 1650 years to reach 50 crore. In 1820 AD, the population of the world reached 100 crore, i.e. 1 Arab. In 1930 and 1975 AD, the world's population reached 3 Arab and 4 Arab respectively. The world's population reached 5 Arab in 1987 AD.

World's population in different duration

Duration	1800	1930	1960	1972	1987	1999	2011
Time taken to increase 1 Arab (years)	All	130	30	14	13	12	12
Population (in Arab)	1	2	3	4	5	6	7

Source: Population Reference Bureau, 2011

The situation of population distribution in the world

Areas/Index	Population (in 10 lakhs)	Birth Rate (in 1000)	Death Rate (in 1000)	Growth Rate (in percent)	Population Doubling Time
World	6987	20	8	1.2	58
Developed Areas	1242	11	10	0.2	350
Developing Areas	5745	22	8	1.4	50
Under-developed Areas	861	35	11	2.4	29
Africa	2051	36	12	2.4	29
North America	346	13	8	0.5	140
Latin America and Caribbean	596	18	6	1.2	58
Asia	4216	18	7	1.1	64
Europe	740	-	11	11	0.0
Oceania	37	-	18	7	1.2

Source: Population Reference Bureau, 2011

The population started to increase rapidly since the middle of 17th century. We can find that the population of Europe, Russia and America was increased rapidly before 1950 AD. This speed of population growth was found in China in about 1700 AD. Population expert Colin Clark expected that the world population would reach 3.5 Arab in 1900 AD. Next Population expert Notestine expected that the world population would reach 3.3 Arab in 2000 AD. But that expected population exceeded before 2000 AD. Similarly, the world's population reached 6 Arab in 1999 AD. There was an increment of 1 Arab population in the world in a short duration of 12 years.