Demographic Changes in Nepal

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Abstract

The study tries to examine how the demographic changes has been occurred within the sub regions of the country by using selected indicators based on the existing data sheet of census 2011and found Nepal has experienced very rapid demographic changes over the last three decades. The size and the density of the population have increased although the annual growth rate has been declined during a decade. As indicated by sex ratios there are more females than males in total population. The large volume of population are living in urban area (63%) and in province 3 (21%) and small volume in province 6 (5.9%) though it is large state by an area. Since 1980 Nepal has seen significant declines in its total fertility rate and crude birth rate, crude death rate and infant mortality rate, alongside significant improvements taken place in life expectancy. This has resulted in noticeable changes in the age structure of the population in the country, the share in the population of children is shrinking against growing numbers and proportions older population aged 60 and above with large proportion of young working age population throughout the nation. This phase is also commonly known as the phase of youth bulge; demographic dividend's or the window of opportunity and due to a higher percentage of young aged population, population momentum has been persistent. The window began in 1992 and projected to be up to 55 years. So it is the period for Nepal to utilize its young population in development.

Key words: Fertility, mortality, window of opportunity & demographic changes.

Introduction

Demography is the scientific study of the size, composition, and spatial distribution of human populations. It investigates changes in population size, composition, and distribution, resulting from fertility, mortality, and migration. Demography is studied to know why things happen and what the consequences are, including the effects of population trend on the environment. Donald J. Bougue, (1969) defines "Demography is a statistical and mathematical study of the size, composition, spatial distribution of

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human population, and of changes overtime in these aspects through the operation of the five processes of fertility, mortality, marriage, migration and social mobility. Although it maintains a continuous descriptive and comparative analysis of trends, in each of these processes and in its net result, its long run goal is to develop a body of theory to explain the events that it charts and compares. " These broad definitions take into view not only the size, composition and distribution of population and changes in them in the long run but also imply human migration and change in the status of population through education, employment, social status, etc.

Nepal has been experiencing very rapid demographic changes in the last few decades as a result of transition from a high-mortality, high-fertility society to a low mortality, low-fertility society within a relatively short span of time and this transition in itself is an extremely positive outcome of the country's development. Looking at Nepal's development in this perspective, there are two major challenges that the country needs to be quickly prepared for: (1) rapid progress of the "ageing" of the society; (2) the duration of the "demographic window of opportunity" period, which is not particularly long compared with other countries that have more advanced economies. The "demographic window of opportunity" is a period of time in a nation's demographic evolution when the proportion of the working-age population is particularly prominent. This occurs when the demographic architecture of a population becomes younger and the percentage of people who are able to work reaches its height. Countries that put the right policies in place and necessary investments to back them have been able to effectively take advantage of this opportunity and reap their demographic dividends in the form of accelerated human development and economic growth. That is what today's industrialized countries and "Asian Tiger" economies have historically done (NPC, 2017).

In Nepal fertility has reduced over time. Although the age at marriage of both sexes has increased overtime, it is still low and has not had a significant impact on fertility. The contraceptive use rate was only 3 percent in 1976, which has increased to about 50 percent in 2011 Indicators of mortality has also declined over time with increasing in Life expectancy at birth, which is 68 years in 2011. The median age of the population is 22.6 years. One third of the total population is made up of children below 14 years and 8 percent is 60 years and above, indicating the young age structure of Nepal's population. The age 60 years and above population has been increasing at an accelerated rate as a consequence of increasing life expectancy at birth and decreasing the proportion of death at each age. High fertility in the past and a recent decline has given rise to a youth bulge. Young people (10-24 years) account for 33 percent of the total population and the youth population age 15-24 years stands at 20 percent. Nepal has a demographic

opportunity on the basis of its current age structure of population. Economically active population will be beneficial to the nation. However, Nepal is facing massive overseas youth migration. This reality leads to the conclusion that the demographic dividend is not automatically translated to the nation's economic development; it requires the right policy environment. Moreover, due to the higher percentage of the young age population, population momentum has been persistent in Nepal (CBS, 2014).

The study is devoted to examine the changing pattern of demographics and its geographic variation by using the indicators of fertility, mortality, population size with its growth rate, population density and age structure of the population (within the sub regions) in the country.

Objectives

The general objective of the study is to examine demographic changes occurred in the country.

The specific objectives of the study are as follows:

- To assess the trend and variation in the demographics of the population in Nepal

- To examine demographic window of opportunity in Nepal

Significance

The finding of this study plays a significant role to provide additional ideas and input about the demographic indicators and its geographic variation as well as changes over the period for individual, researcher and students. Furthermore, the study will provide reference material for those who are interested about it. This study will work as a basis for further research.

Methodology

The paper follows the descriptive and exploratory research method based on the existing raw data sheet of 2011, National Population Census and other previous censuses data collected by CBS. The data from these sources are used to examine the changing pattern of demographics and its geographic variation in respect to the new structured sub regions of the country. Furthermore, this paper is based on review of existing literature mainly books, journal, article and reports.

Interpretation and Analysis of the Data

Demographic Indicators in Nepal

The Demographic outcomes of size structure and spatial distribution of population are determine by the demographic process of fertility mortality and migration. The demographic outcomes in turn affect the operation of socioeconomic process and the socio-economic process help to determine the socio economic outcome and environmental quality (CBS, 2014).

In this section the trend and the situation of demographic indicators are analyzed by using their measured indicators such size and growth rate, density, of population, total fertility rate and crude birth rate to measure fertility, crude death rate, infant mortality rate and life expectancy at birth to measure mortality, and median age and age structure of population. To reflect the gender differences in size of the population sex ration has been used.

Population Size, Growth Rate, Density and Sex Ratio in Nepal

The population growth rate is the average annual exponential rate of population change over a given period, The sex ratio is the number male per hundred female, the most popular index of sex composition in demography and the Density is used to measure the pressure of population on land, and refers the number of persons per square kilometer of land area (CBS, 2014). The demographic structure of the country can be understood by the analysis of these indicators.

Table 1 shows the size of total population with its average annual growth rates and sex ratio and the density of total population for the various censuses. Data of the table shows the size of the population has increased in every census. The population enumerated in 1952 was 8.2 million increased to 23.1 million in 2001 and 26.4 million in 2011 which is 3.3 million more than the population recorded in 2001. The annual growth rate population has remained of more than 2 percent for 40 years till 2001census due to fast declining in the mortality without a corresponding decline in fertility. At the time of the latest census 2011 average annual growth rate of population is 1.35 percent far lower than the 2.25 percent recorded in the 2001 census which is attributed both to a decline in fertility and the emigration of youth. Even though the growth rate is quite small but the size of the population increasing is matter. Similarly, Data from different censuses indicate that the density of the population is increasing in all censuses. It was 102 percent in 1981 increased to 180 percent in 2011, shows pressure of population on land is increasing in the country.

Data on sex ratio is used to express the sex differences in the total population. It shows sex ratios are low in all censuses except in the censuses of 1971 and 1981 i.e there are more females than males in Nepal. A high sex ratio was reported in 1981 while a low sex ratio of 94 was recorded in 2011, indicates the portion of female is higher than that of male population in total population which may be attributed to male migration for employment while females remain at home.

Table 1: Population size, growth rate, density and sex ratio of total population

Census years	Total population	Growth rate (%)	Sex ratio	Population density (persons per sq.km)
1952/54	8,256,625	2.30	96.8	-
1 961	9,412,996	1.65	97.3	-
1971	11,555,983	2.07	101.4	-
1981	15,022,839	2.62	105.0	102.01
1991	18,491,097	2.10	99.5	125.63
2001	23,151,423	2.24	99.8	157.30
2011	26,494,504	1.35	94.2	180.00

Source: Data Sheet 2011 Census, and Data Sheet 2001 & CBS, 2014

Distribution of Population, Growth Rate, Density and Sex Ratio by Rural Urban Residence and Province Level

Data of the table is devoted to the new structure of the country i.e 293 municipalities known as urban area and 460 rural municipalities (rural area) as well as seven provinces of the country. The provinces of Nepal were formed on 20 September 2015.

Table 2 presents the data on percentage distribution of population by rural urban residence and province level with its growth rate, density, and sex ratio of population. Data shows the proportion of population living in urban area is higher than in rural area, that constitute 63.19 and 36.8 percent respectively, which is attributed that many more rural areas are recently declared as the municipalities have been added in urban population and the inflow of rural population to urban centers in search of better opportunity.

Among seven provinces, province 3 has the largest volume of population (20.9%) with the highest population growth rate per annum (1.91%). It may be due to consisting Kathmandu

valley and other two metropolitan cities in this state. Although province 2 is known as the smallest state by an area, it is reported as second most populous (20.4%) state and most densely (550) populated state than other states. As well as the smallest proportion of population live in province 6 (5.93%) with having lowest density of population (49), though it is largest state by an area. As indicated by sex ratio, among these all provinces, except in province 2 there are more females than males' population in total population**.**

Table 2: Percentage distribution population and growth rate by rural urban residence and provinces, 2014

Areas	Percentage population of the total population	Population growth rate	Sex ratio of population	Density people/km²
Urban	63.2	-	-	-
Rural	36.8	-	-	-
Province-1	17.2	0.76	91.48	175
Province-2	20.4	1.60	101.18	550
Province-3	20.9	1.91	98.77	272
Province-4	9.1	0.37	83.08	108
Province-5	16.98	1.29	90.73	217
Province-6	5.9	1.80	95.69	49
Province-7	9.6	1.53	91.25	130
Nepal	**100**	**1.35**	**94.2**	**180**

Source: Data Sheet 2011 Census, Data Sheet 2001 Census, & GoN, 2021

Situation of Fertility and Mortality in Nepal

Fertility and mortality are major demographic process in determining the structure, distribution and growth rate of any population. The study used total fertility rate and crude birth rate as the measured indicators to examine the level of fertility and crude death rate, infant mortality rate, and life expectancy at birth are used to examine the level of mortality.

Total Fertility Rate: The total fertility rate is the average number of children a woman would bear over the course of her lifetime if current age-specific fertility rates remained constant throughout her childbearing years (normally between the ages of 15 and 49

years). The current total fertility rate is an indicator of the level of fertility at a given time. It is expressed as children per woman.

The Crude Birth Rate: The crude birth rate is the total number of live births occurring during a year per thousand midyear population.

Crude Death Rate: The crude death rate is the average annual number of deaths per 1,000 population over a given time period.

Infant Mortality Rate: Infant mortality rate is probability of dying between birth and exact age one. It is expressed as deaths per 1,000 live births. It is one of the major indicetor to the social development of the country or the region.

Life Expectancy at Birth: Life expectancy at a specific age is the average number of additional years a person of that age could expect to live if current mortality levels observed for ages above that age were to continue for the rest of that person's life. In particular life expectancy at birth is the average number of years a newborn would live if current age specific mortality rate were to continue.

Table 3 displays the trends of mortality and fertility since 1961 to 2011 by using their measured indicators and shows over the last three decades Nepal has seen significant declines in its total fertility rate, mortality rates, and population growth, alongside significant improvements in life expectancy. Among them Nepal experienced in the last three decades, the decline in its total fertility rate (TFR) and crude birth rate(CBR) has been the most striking feature. Figure of table 3 indicates, during this time, total fertility rates declined from 6 children per woman in 1981 to 2.6 children per woman in 2011and CBR has declined from 39.7 to 22.4 per 1000 population in 2011. One of the main reasons for the fertility transition in Nepal is the effective social interaction process and its impact on the timing and pace of fertility.

Similarly, Nepal saw its level of mortality is also declining over the years as indicated by CDR and IMR with increasing life expectancy at birth for both sexes. Of which crude death rate decline by more than half and infant mortality rate by two third in during the period 1981 to 2011. Figure shows crude death rates in Nepal decreased from 13.5 deaths per 1,000 in 1981 to 7 in 2011 and IMR declined from 117 per 1000 live births to 40.5 during same period. As well, data reveals striking improvement in the life expectancy, which accounted 36 years in 1961, increased to 60 years in 2001and almost 67 years in 2011. During this period it has increased by more than 30 years which may be due to an improvement in medical facilities and health awareness. The, life expectancy of female

has overtaken males in last 30 years. Hence we can say at present Nepal is in the stage of demographic transition.

Table 3: Trends in demographic indicators of Nepal.

Indicators	1961		1971	1981	1991	2001	2011
CBR	47.0		42.0	39.7	39.0	33.3	22.4
TFR	-		6.3	6.3	5.6	4.1	2.6
CDR	22.0		21.4	13.5	13.3	10.3	7.0
IMR	--		172.0	117.0	97.0	64.0	40.50
Life Expectancy at Birth	male	35.2	37.0	50.9	55.0	61.1	65.4
	female	37.4	39.9	48.1	53.5	61.6	68.0
	total	36.0	41.1	49.8	54.3	60.4	66.6

Source: Data Sheet 2011 Census, CBS 1991, & CBS 2014

Demographic Indicators in Nepal by Ecological Belts

Nepal has three distinct ecological regions. These are Mountains, Hills and Tarai. In addition to the unequal size of their population, these various regions experience differentials form of fertility, mortality and migration. Figure of table 4 shows the comparative demographic situation in geographical regions in since 1981 to 2011. During this period, there has been marked decreased in the level of fertility and mortality with increasing life expectancy over the years in all three geographical regions but in different manner. It indicates demographic transition has occurred in Nepal.

Among these regions, level of fertility (CBR 24.6 and TFR 3.8) and mortality (CDR 8.5and IMR 50.2) are observed high in Mountain region with low life expectancy (64 years) and low in Hill region with highest life expectancies for both sexes in 2011. Terai region stand at middle range in all these indicators of fertility and mortality.

Table 4: Trends in demographic indicators in Nepal by ecological belts

Census Years	CBR	TFR	CDR	IMR	Life Expectancy at Birth		
					Male	Female	Total
Mountain							
1981	-	5.9		187.0	-	-	39.3
1991	42.5	6.6		155.0	-	-	44.2
2001	33.5	4.4		-	-	-	

2011	24.6	3.8	8.5	50.2	62.8	65.5	64.1

Hill

1981	-	6.2		164.0	-	-	42.7
1991	39.7	5.8		83.0	-	-	57.3
2001	34.3	3.2			-	-	
2011	20.5	2.4	7.8	30.6	67.6	70.3	68.9

Terai

1981	-	5.9		124.0	-	-	49.2
1991	35.8	5.5		112.0	-	-	51.8
2001	29.4	3.2			-	-	
2011	22.5	2.5	6.8	48.8	64.1	66.3	65.1

Source: Data Sheet 2011 Census, CBS 1991, & CBS, 2014

Demographic Indicators by Urban Rural Residence and Province Level

Data shows the level of fertility and mortality is lower in urban with high life expectancies for both male and female. Urban area reported TFR at just 1.81children per women which is below the fertility of replacement level as against 2.3 for rural area and CDR and IMR reported 6.7 per thousand population and 37.3 per thousand live births which is below the national level as against the 7 and 43.22 for rural area with high life expectancy for both male and female (67.4 and 70.5 years respectively).

Among seven provinces, province 3 and province 4 reported low level of fertility as indicated by CBR (18.2/1000 population), and TFR (2.2children/woman), and lowest mortality as indicated by CDR(7.3/1000 population), IMR(23.4/1000 live births) as well as highest life expectancy at birth for both sexes, which are the stronger then the national level, and province six reflects the poor situation in these indicators. Remaining other states are near the national level.

Table 5: Situation of demographic indicators by urban rural residence and province   level

Areas	CBR	TFR	CDR	IMR	Life expectancy at birth	
					Male	Female
Urban	18.8	1.8	6.7	37.3	67.4	70.5
Rural	21.6	2.3	7.0	43.2	65.1	66.2
Province-1	20.9	2.6	8.3	34.9	66.4	68.7
Province-2	25.1	2.8	5.6	56.6	62.8	64.9
Province-3	18.2	2.2	7.3	23.4	69.1	70.8
Province-4	18.5	2.1	8.2	23.3	69.4	70.9
Province-5	23.2	2.7	7.8	40.2	64.8	66.5
Province-6	28.2	4.6	8.2	52.3	60.9	62.9
Province-7	25.2	3.6	7.9	46.7	63.8	67.3
Nepal	21.8	2.5	7.3	40.5	65.5	67.9

Source: Data sheet 2011 census & CBS, 2014

Age Distribution of Population in Nepal

The age structure of population is the distribution of population by age, which is the most important variable for demographic analysis. The size and age composition of a population are determined jointly by three demographic processes: fertility, mortality and migration. Fertility levels and trends determine the size of each birth cohort; while mortality levels and trends determine what proportion of those cohorts eventually survive to old age (UN, 2017). The age structure of the population is very important from a policy and programme point of view.

Nepal's demographic situation is characterized by declining mortality and a steady decline in fertility. This has resulted in noticeable changes in the age structure of the population in the country, such that the share in the population of children is shrinking against growing numbers and proportions older population aged 60 and above with a large proportion of young working age population throughout the Nation. This phase is also commonly known as the phase of youth bulge; demographic dividend's or the window of opportunity.

This section describes trends in three broad age distribution of the populations with their average annual growth rates and median age for the various censuses at national

level. For the purpose of easy comparison and understanding age structure of population, population have been divided into three broad age group known as child population at aged 0-14 years, working or adult population of 15-59 years and elderly population aged 60 and over.

One key impact of the rapid demographic changes in Nepal is that its population structure will experience dramatic changes as well. Nepal's population growth rates, age structure of the population with their average annual growth have also seen significant change in the past three decades presented in table 4.

Table illustrates that the proportion of children age 0-14 years has increased from 38 percent in 1952 to 42 percent in 1991 with decreased from 57 percent to 52 percentage of working age population percent during the same period whereas there has been a steady increase of the aged population since 1950s. Then after since last two decades, proportion and growth rate of population below 0-14 years tends to decreasing with increasing in the proportion and growth rate of working and old aged population. Among these age groups, more than half of the population (57%) falls in the 15-59 years categories with more than 2 percent annual growth rate in 2011 which is higher than the national population growth rate, increased from 52 percent in 1991 and the old population aged 60 and above constitute 8.1 percent in 2011 with 3.8 percent average annual growth rate increased from 5.8 percent with 2.8 percent average annual growth rate in 1991. It seems the growth rate of elderly population is three times higher than that of national population growth rate (1.35%). It may be due to the declining fertility and overall improvement in the mortality and life expectancy.

Similarly, table also presents the trend in median age since 1971 -2011. The median age is the age that divides the population into two numerically equals groups, i.e. half the population is younger than the age, while half is older. Data shows fluctuation trends in median age and was around 20 prior to 2001, and increased to 22.2 6 years in 2011. It affirms that, Nepal is in the phase of age structure transition and population is gradually ageing over the years.

Table 6: Population size, growth rate and broad age distribution

Census year	proportion population<15	Growth rate (%)	Population 15-59 (%)	Growth rate(%)	Population 60+ (%)	Growth rate(%)	Total population growth rate (%)	Median age
1952/54	38.4		56.6		5.0		2.30	-
1 961	39.9		54.4		5.3		1.65	-
1971	40.5	2.2	53.9	1.9	5.6	2.6	2.07	20.3
1981	41.4	2.9	52.9	2.5	5.7	2.8	2.62	19.90
1991	42.4	2.3	51.8	1.9	5.8	2.2	2.10	18.92
2001	39.4	1.3	54.1	2.5	6.5	3.2	2.24	20.00
2011	34.9	0.3	57.0	2.1	8.1	3.8	1.35	22.26

Source: CBS, 1991, CBS, 2001& CBS, 2014

Window of Demographic Opportunity/Population Dividend in Nepal

For a more precise determination of Nepal's demographic window of opportunity, we take into account growth rates for the total population, working-age population, and dependent populations. The demographic window of opportunity for the demographic dividend occurs when the growth rate of the working-age population (ages 15–64) is greater than the total population growth rate, when the dependency burden is lessened due to the prominence of a large and growing working-age population visà-vis the dependent populations. The window occurs as the working population grows while child and old-age dependency ratios remain small. In a typical transition the window opens when the working-age population gains prominence while birth rates fall, thus slowing the growth of the younger dependent population under the age of 15. The window lasts until the elderly population, although growing, is still relatively small. The window closes when the total population growth rate begins to exceed the rate of growth of the working-age population (NPC, 2017).

 Data shows that Nepal is currently within the demographic window of opportunity. The window began in 1992 when the growth rate of the working-age population first exceeded the overall total population growth rate. The window of opportunity is predicted to end in 2047 when the growth of the working-age population will for the first time since 1992 fall below the total population growth rate. Thus, the demographic window of opportunity is projected to be 55 years. It is important to note that according to these calculations, Nepal has already spent 25 years i.e 45 percent of its window of opportunity and has 30 years remaining to reap this dividend (NPC, 2017).

Nepal's population growth rates, annual population change, births, deaths, have also seen significant change in the past three decades. In 1981, the average annual rate of population change was 2.62 percent and this rate decreased to 2.24 percent by 2001 and further declined to 1.35 percent per year in 2011, was attributed both to a decline in fertility and the emigration of youth. Due to these result data shows the declining trend in the proportion and growth rate of population below 0-14 years since the last decade (41% 1991 to 35% in 2011) and increasing in the proportion and growth rate of working and old aged population. Of the total population more than half (57%) of the population falls in the 15-59 years categories with more than 2 percent annual growth rate which is higher than national population growth rate of 1.35 percent in 2011. On the other hand, the older population age 60 and above has increased from 5.7 percent in 1981 to 8.1 percent in 2011 with 3.8 percent growth rate per year i.e three times higher than national population growth rate. Thus the higher proportion of working age population conforms that the Nepali population is primarily young and Nepal is experiencing the window of opportunity and due to a higher percentage of young aged population, population momentum has been persistent. It is the period for Nepal to utilize its young population in development. These population elements are directly related to the economic development of the country.

The demographic shift has initiated a demographic dividend, one of the important issues that should be addressed in the policy. The population policy, combined with effective public policies during his time period of the demographic dividend, can help facilitate more rapid economic growth and put less strain on families. In many countries this time period has led to increasingly smaller families, rising income, and rising life expectancy rates. However, dramatic social changes can occur during this time, such as increasing divorce rates, postponement of marriage, single person households, female headed households, changing family relationships etc. This situation increases labor supply and human capital. These issues should be addressed properly while developing the population policy of the country (CBS, 2014).

Conclusion

The study is about to examine the trend in demographics by using some selected indicators to examine how the demographic changes has been occurred within the sub regions of the country. Demographic trends describe the historical changes in demographics in a population over time. Nepal's population size and structure, average annual growth rates, density, births, deaths, sex ratio have also seen significant changes over the years but mostly in the past three decades.

Data shows the size of the population a has increased in every census which was counted 8.2 million in 1952 and increased to 26.4 million in 2011 although the annual growth rate has been declined from 2.24%-to-1.35% during a decades. Similarly, with increasing population size the density has also increased (102% in 1981 to 180% in 2011) shows increased the pressure of population on land over the times. Of the total population as indicated by sex ratio except in the censuses of 1971 and 1981 there are more females than males in Nepal. In the newly structured sub regions, large volume of population are living in urban area (63.19%) and in province 3 (20.9%) with having highest population growth rate (1.91% per annum) whereas smallest proportion of population live in province 6 (5.93%) with the lowest density of population (56%) though it is largest state by an area. Among all provinces, except in province 2 there are more females than male's population in total population**.**

Trends in indicators of fertility and mortality indicates since 1980, Nepal has seen significant declines in its total fertility rate and crude birth rate, crude death rate and infant mortality rate mortality rates, alongside significant improvements in life expectancy in all sub regions of the country. Decline in its total fertility rate (TFR) and crude birth rate (CBR) has been the most striking, crude death rate decline by more than half and Infant mortality rate by two third and life expectancy has increased by more than 16 years in during the period 1981 to 2011. Due to these result, Nepal has experiencing the changes in its population structure as well. The proportion and growth rate of population below 0-14 years tend to shrinking along with increasing the proportion and growth rate of working and old aged population. Population of 2011 shows more than half (57%) of the population falls in the age group 15-59 years categories with more than 2 percent annual growth rate which is higher than national population growth rate of 1.35. This structure of population conforms that the Nepali population is primarily young and Nepal is experiencing the window of opportunity and due to a higher percentage of young aged population, population momentum has been persistent. The window began in 1992 and projected to be up to 55 years. So it is the period for Nepal to utilize its young population in development.

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