

Trends of World Population Growth

Dr. Jitender Saroha
Associate Professor,
Dr. B.R.Ambedkar College,
University of Delhi.

Abstract: During pre-historic and majority time of historic period the world population grew at a very slow pace and with a lot of fluctuations. In last ten thousand years world population growth accelerated at three distinct times associated with agricultural or Neolithic revolution (8000 BC), industrial revolution (1750) and medical revolution (1950). The population growth rate was around 0.001 per cent around 8000 BC and 0.05 per cent at 1 AD and 0.06 per cent around AD 1750. The population growth rates achieved peak level after 1950. The world population increased from 2.5 billion in 1950 to 5 billion by 1987 and to 7.5 billion in 2017. It is noteworthy that it took millions of years for world population to reach 2.5 billion. But the next 2.5 billion joined in just 37 years. Further the next 2.5 billion were added in just 30 years time span. The objectives of the present paper are – (i) to describe the trends of world population growth; (ii) to identify the major determinants of population expansion or explosion; (iii) to differentiate the trends of population growth in MDCs and LDCs and (iv) finally, to highlight the differentials of population growth at continental level.

Key Words: Neolithic, industrial, Revolution, Growth rate, CBR and CDR.

At world level population growth is a function of differential rates of birth and death. The most common measurements of fertility and mortality are crude birth rate (CBR – number of live births per thousand persons) and crude death rate (CDR – number of deaths per thousand persons), respectively. During pre-historic and majority time of historic period the population grew at a very slow rate. The rapid increase in population is a recent phenomenon. During the last ten thousand years, the growth of world population accelerated at three distinct times associated with revolutions such as agricultural revolution or Neolithic Revolution, industrial revolution and medical revolution.

Due to scanty evidences the population estimates of past are based on broad speculations. Even for the recent past it is difficult to arrive at a reliable estimate of the world population. The first modern census was held in Sweden (1749). Later in USA (1790), Great Britain and France (1801) and in India in 1872 census operations were started and most of these were incomplete. In several third world countries census operations have started after the World War II. Therefore, the population estimates prior to 1900 are highly fragmentary and outcome of scholarly guesses.

Pre-Neolithic Phase

Man most probably originated in tropical Africa and Asia. In the initial phase, the population of human beings was limited. In the pre-historic period of several-hundred-thousand-year of occupancy of earth surface by the Homo erectus, the Homo habilis and Neanderthal the crude birth rates and death rates remained high and natural increase was negligible. During this time, people survived on the basis of hunting, fishing and food gathering. This time period population fluctuated with phases of food security and insecurity. Whenever and wherever food was easily obtained, population increased, but it declined when people were unable to locate enough animals or vegetation nearby.

The economy was based on hunting and food gathering. The societies were tribal societies based on bands. The invention of fire produced revolutionary changes in the life of our ancestors. The tropical savanna grasslands were modified by fire and threat from other animals were reduced. In addition to security, fire provided cooked food instead of raw which has better nutritional value. But the adverse physical environment, nomadic way of living and the poor nourishment were all limiting the growth of population. The bands were isolated from one another by large uninhabited areas and density of population was very low (about 4 persons per 100 square km).

Neolithic Revolution or Agricultural Revolution

From Neolithic period upto the Christian era the population growth rate was slow and total population was stagnant or increased marginally with fluctuations. At 10,000 BC world population is estimated to be around 4 million. During Neolithic revolution population started increasing gradually due to increased food security provided by agriculture and animal husbandry. By 8000 BC world population became around 5 million and with settled life and increased food security number and distribution of population increased. The burst of population growth around 8000 BC was caused due to Neolithic or Agricultural revolution. It represents the time when human beings (Homo sapiens) first domesticated plants and animals and were not entirely dependent on food gathering and hunting. By cultivation of crops and rearing of animals, human beings created larger and more stable sources of food and it provided base for the survival of more people. It is estimated that the increased food supplies and security provided better nutrition and resistance to diseases. This resulted into slight improvement in life expectancy and hence a growth of population.

By 3000 BC world population became 14 million and it was concentrated mainly in the fertile river valleys especially in the Nile valley, the Euphrates, the Indus and the Hwang Ho. In addition to population growth in these cores of ancient civilizations population gradually increased in the coastal part of the Mediterranean Sea, south west and eastern Asian river

valleys and western Europe. By Christian era world population increased in the estimated range of 200 to 300 million. The five major areas of population concentration were – (i) Plains of India, (ii) north and eastern China, (iii) coastal Mediterranean Sea, (iv) South East Asia and (v) South Asia.

Despite agricultural revolution, the growth of human population and its distribution remained limited. Population growth rate was low and even during this phase food supplies were still unpredictable because to heavy dependence on climate and other physical conditions. Farmers prospered in areas of abundant outputs, but when unfavourable climatic conditions caused output failure or low production, the crude death rate would sour. In addition to frequent food shortages and famines, war, diseases and epidemics also took their toll. For nearly about 10,000 years after the Neolithic revolution, the world population grew at a modest pace. The population growth rate was around 0.001 per cent around 8000 BC and 0.05 per cent at 1 AD and 0.06 per cent around AD 1750.

The main characteristics of world population prior to industrial revolution were high crude death rates and high infant mortality rates and low life expectancy due to frequent famines, undernourishment and vulnerability to epidemics and lack of health and medical facilities. The birth rates and death rates were on higher side and birth rates fluctuated along with fluctuations in death rates. Therefore, generally the periods of population decline due to sudden increase in CDR were followed by short-term population revival phases. The overall result was a very gradual and slow increase in long-term population of the world. The Neolithic revolution resulted into growth of sedentary settlements instead of nomadic life and also resulted into the growth of ancient and medieval towns and cities in some parts of the world.

Industrial Revolution

The second major turning point in the history of world population growth is associated with industrial revolution. After 1750, the world population suddenly began to grow ten times faster than in past i.e. at around 0.5 per cent growth rate. For example, the world population increased only one-half million in 1750 but increased by about 5 million in 1800. The sudden increase in population is associated with industrial revolution. Industrial revolution started in England and Germany in the late eighteenth century and spread to the European countries and North America during the nineteenth century.

Industrial revolution resulted into mass scale production with the help of power-driven machines. The mass scale production required mass scale distribution which depended on efficient modes of transportation. The industrial revolution was energized by fossil fuels especially coal. Therefore industrial revolution transformed the ways goods are manufactured and delivered to regional, national and international markets. It resulted into increase in output

and productivity. The increased wealth resulted into increased job opportunities and migration stream from rural to urban areas became intense. These changes were reflected in diversified economies with declining share of primary activities and rising share of secondary and tertiary activities.

Introduction of new machines helped farmers in increasing production and productivity to maintain food security for the rapidly growing population. Increased efficiency and mechanization not only freed people from rural and primary activity areas to migrate and work in factories but also generated surplus production for the industrial workers and urban dwellers.

Industrial revolution resulted into increased per capita income, increased gross domestic product and widening tax network. The wealth produced by the industrial revolution was also diverted to improve sanitation and personal hygiene. The network of sewer systems was extended over cities and food and water supplies were safeguarded from risks of contamination. These planned investments and improvements in civic services resulted in better health conditions and longer life spans. The sudden decline in death rates and gradual decline in birth rates resulted into population explosion or expansion. The world population increased rapidly from 791 million in 1750 to 2521 million in 1950. This three - fold increase in world population in just 200 years was mainly the result of industrial revolution. The population growth rate increased seven times from 0.06 per cent in 1750 to 0.43 in 1800 and doubled to 0.81 per cent by 1950. The industrial revolution first surfaced in more developed countries (MDCs) therefore, at this time the population growth rates were higher in MDCs as compared to LDCs. Between 1750 to 1850 the population growth rate in MDCs was 0.6 per cent and in LDCs 0.4 per cent. Likewise, between 1850 and 1950 the population growth rates in MDCs and LDCs were 0.9 and 0.6 per cent respectively.

Medical Revolution

The LDCs located in Africa, Asia and Latin America entered in population explosion stage of demographic transition during the second half of the twentieth century but the determinants were different from that of the case of Europe and North America 200 years earlier. It was caused mainly by diffusion of medical technology from the MDCs to LDCs. This diffusion of health and medical facilities and techniques eliminated many of the traditional causes of death in LDCs. Further the immunization and vaccination against diseases resulted into rapid decline in IMR and child mortality rates. The healthier and longer life spans contributed in more number of births. The introduction of health and medical facilities without economic and socio-cultural transformation resulted into increase in gap between CBR and CDR because the CBR declined gradually but CDR declined all of a sudden. Therefore, population expanded with increasing growth rates.

In MDCs population growth rate reached its peak in 1953-54 (1.22 per cent) and after that started declining but in LDCs growth rates increased from about 2.0 per cent in 1950 to peak level of 2.55 per cent in 1968 and after that with marginal decline continued to be around 2 per cent by 1990. Even after onset of declining trend the population growth rate of LDCs in 2017 is 1.4 per cent which still higher than the peak level population growth rates of MDCs of 1953-54. In the Least Developed Countries (48 countries out of which 33 are in Africa and 9 in Asia) the population growth rate was about 2 per cent in 1950 and reached the peak level in 1992 (2.76 per cent). Therefore, sudden decline in mortality rates and lag in fertility decline resulted into population explosion in LDCs and Least Developed Countries.

The world population increased from 2.5 billion in 1950 to 5 billion by 1987 and to 7.5 billion in 2017. It is noteworthy that it took millions of years for world population to reach 2.5 billion. But the next 2.5 billion joined in just 37 years. Further the next 2.5 billion were added in just 30 years time span. It took million of years for world population to become 1 billion in 1804 but it doubled to 2 billion within 123 years in 1927. The addition of next one billion to become 3 billion required only 33 years and in 1960 the world population became 3 billion. Thereafter in next 39 years world population doubled to 6 billion and at present in 2017 the world population is 7.5 billion (Table 1).

Table 1: World Population Projections of Past and Milestones in Billions

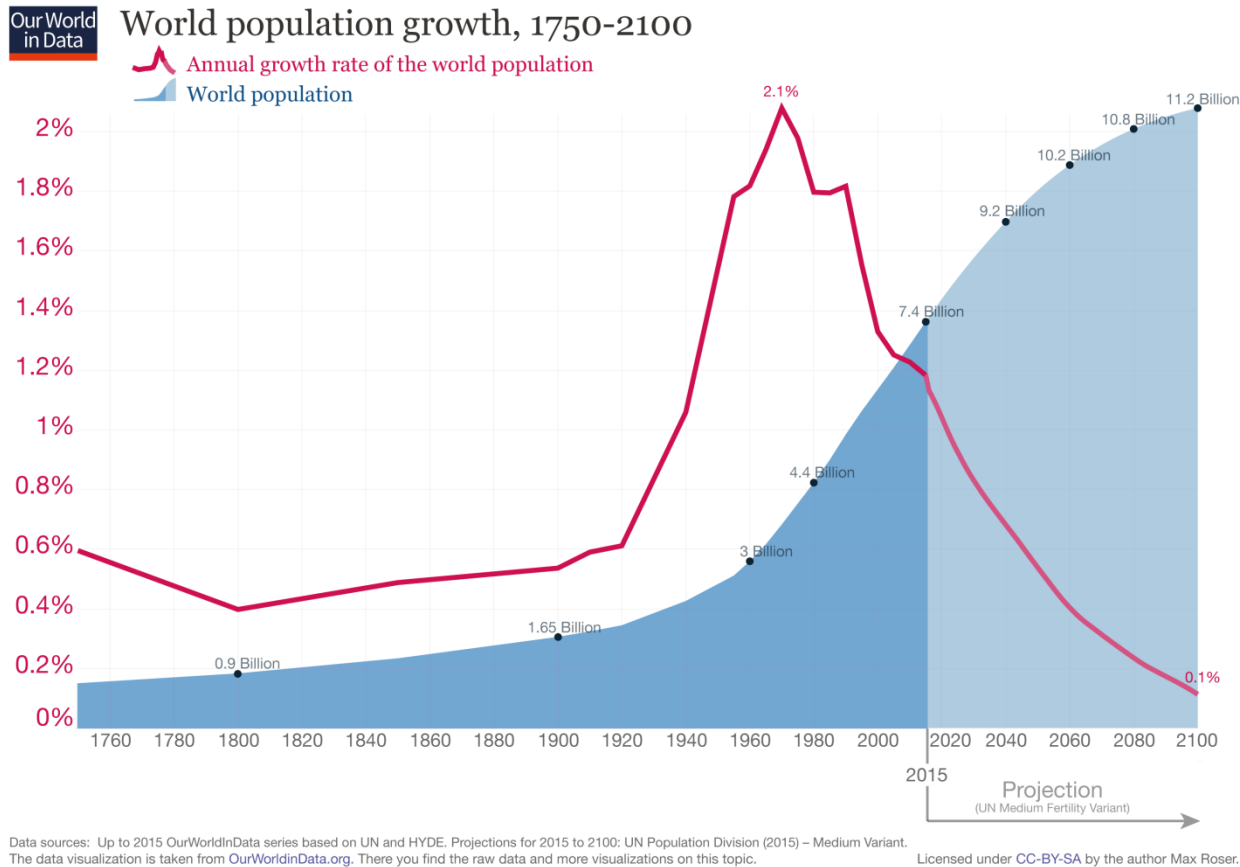
Year	Population	Years Elapsed
10,000 BC	4 Millions	-
3000 BC	14 Millions	-
1 CE	300 Millions	-
1500	458 Millions	-
1750	791 Millions	-
1804	1Billion	Thousands of years
1927	2 Billion	123
1960	3 Billion	33
1974	4 Billion	14
1987	5 (Day of 5 Billion – July 11,1987)	12
1999	6 (Day of 6 Billion – October 12, 1999)	12
2011	7 (Day of 7 Billion – October 31, 2011)	12
2017	7.5 Billion	At Present
2024	8 Billion	13
2042	9 Billion	18

Source: United Nations Population Division.

Due to economic advancement, improvement in level of literacy (especially female literacy), women empowerment, urbanization, socio-cultural changes, rising aspirations and rising cost of

living, improvements in health and medical facilities (especially child-mother care) the crude birth rates also start declining at a faster pace and population starts growing at declining growth rates (Figure 1). That is why, now the next one billion population addition is projected by UN Population Division to take 13 years and further next one billion population additions in more than that (18 years).

Figure 1: World Population Growth, 1750 - 2100



Source: <https://ourworldindata.org/wp-content/uploads/2013/05/updated-World-Population-Growth-1750-2100.png>

Trends of Population Growth by Continents

So far the focus was on the trends of population growth at world level and growth differentials at macro level in terms of MDCs and LDCs. The trends of population growth show different patterns at continental level and contrasting trends require special attention. The world population has increased 9.5 times from 1750 to 2017 but the population of Europe increased by 4.5 times and of North America 181 times in the same period (Table 2). This contrast is mainly due to emigration from Europe and immigration in North America because at continental level population growth is a function of fertility, mortality and migration. Likewise the population of Australia has increased 21 times from 1750 to 2017 mainly because of migration.

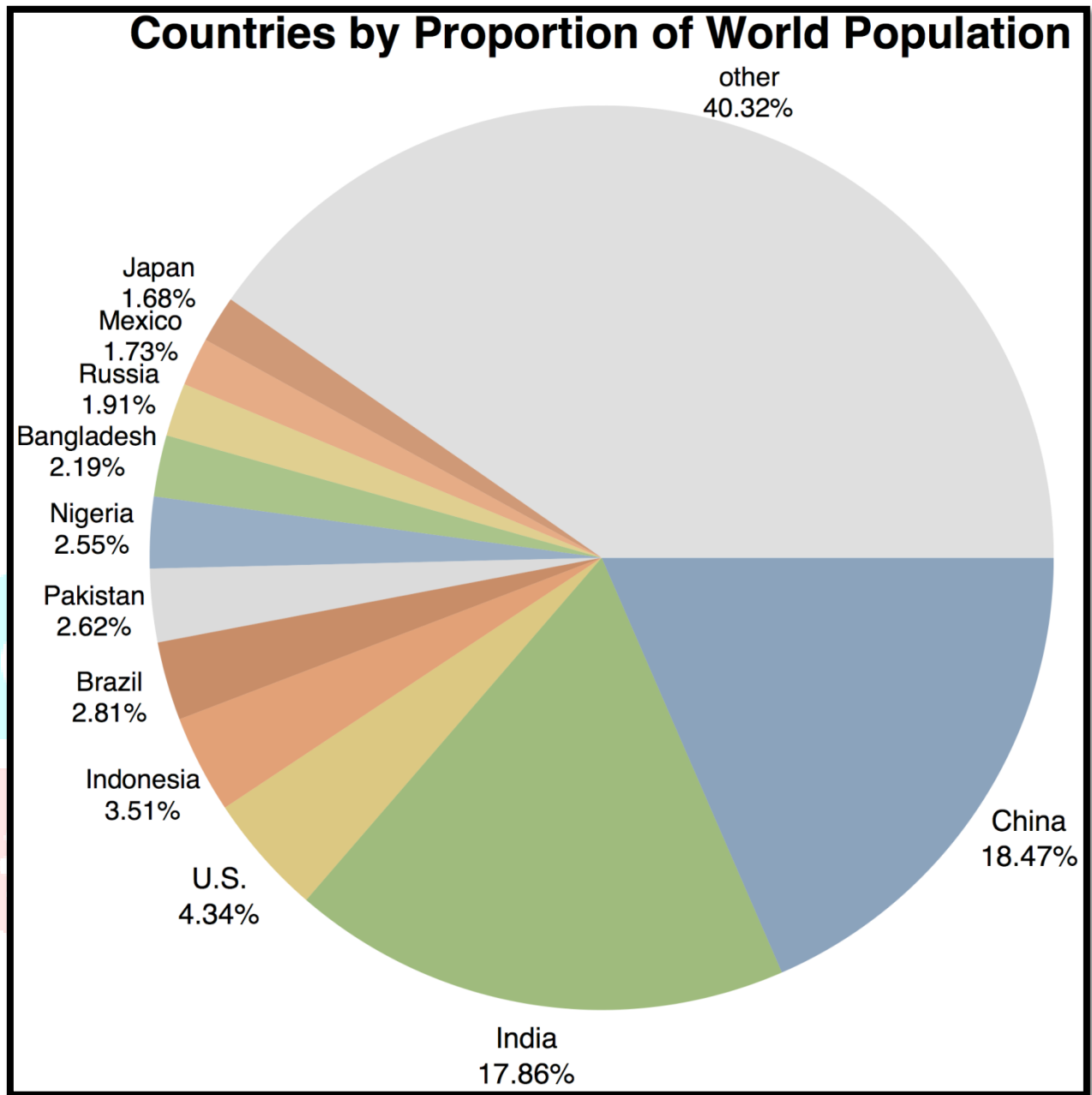
Table 2: Population of the World and its Major Areas (in Million), 1750 – 2017

Year	Africa	Asia	Europe	Latin America and Caribbean	North America	Oceania	World
1750	106	502	163	16	2	2	791
1800	107	635	203	24	7	2	978
1850	111	809	276	38	26	2	1262
1900	133	947	408	74	82	6	1650
1950	221	1402	547	167	172	13	2521
1975	416	2378	677	326	242	21.5	4061
2000	814	3714	726	527	314	31.1	6127
2017	1250	4494	745	643	362	42	7536

Source: United Nations Population Division.

- (i) **Asia:** Asia was the most population continent in the world in 1750. At this time its population was 502 million and its share in world population was 63.5 per cent. Its population increased about 2.8 times in 200 years (1750 – 1950). In next 67 years due to population explosion its population further increased 3.2 times. At present Asia constitutes 59.6 per cent population of the world and has maintained its position as most populous continent of the world. In 1960s and 1970s the population growth rates were at peak (above 2 per cent level), during 1980-85 it marginally declined to 1.9 per cent and further declined to 1.6 per cent in 1990-95. At present CBR and CDR in Asia are 18 and 7 per thousand respectively, therefore, the population growth rate is 1.1 per cent. In the list of 10 most populous countries of the world 5 are from Asia. China (18.47 per cent), India (17.86 per cent), Indonesia (3.51), Pakistan (2.62 per cent) and Bangladesh (2.19 per cent) together constitute about 45 per cent population of the world (Figure 2).

Figure 2: Share of Major Countries in World Population



Source:

https://upload.wikimedia.org/wikipedia/commons/0/03/World_population_percentage_pie_chart.png

- (ii) **Africa:** Africa is the second most populous continent of the world after Asia with 1.25 billion people. The population of Africa is less than the population of India. During 1750 -1850 the population of Africa remained almost the same due to high CBR and high CDRs. The population of Africa doubled between 1850 and 1950. In next 25 years is doubled and in next 25 years again doubled and it is projected to

further double in next 25 years. The doubling of population in 25 years was suggested by Malthus in his population principle seems to be operating in case of Africa continent. In 1900 the share of Africa in world population was 8.1 and at present it is 16.6 per cent (Table 2). Nigeria the most populous country of Africa ranks seventh in world. By 2050 Nigeria (rank 3), Congo, D.R.(rank 8) and Ethiopia (rank 10) will be in the list of 10 most populous countries of the world. During 1980s and 1990s and the growth rate of Africa remained around 3 per cent. At present the CBR and CDR are 35 and 9 respectively, therefore, the population growth rate is still 2.6 per cent which is highest among continents.

Table 3: Population of the World and its Major Areas Share (%), 1750 – 2017

Year	Africa	Asia	Europe	Latin America and Caribbean	North America	Oceania	World
1750	13.4	63.5	20.6	2.0	0.3	0.3	100
1800	10.9	64.9	20.8	2.5	0.7	0.2	100
1850	8.8	64.1	21.9	3.0	2.1	0.2	100
1900	8.1	57.4	24.7	4.5	5.0	0.4	100
1950	8.8	55.6	21.7	6.6	6.8	0.5	100
1975	10.2	58.6	16.7	8.0	6.0	0.5	100
2000	13.3	60.7	11.8	8.6	5.1	0.5	100
2017	16.6	59.6	9.9	8.5	4.8	0.6	100

- (iii) **Europe:** Europe is the third most populous continent of the world with 745 million people, accounting for about 10 per cent of the population of world. In 1900 its share in world population was about 25 per cent. Europe is the only continent which recorded negative growth rates of population in the first decade of twenty first century. At present CBR and CDR are same at 11 per thousand and therefore Europe is having zero growth rate of population. The most populous country of Europe is Russia with zero growth rate and second most populous country is Germany with negative growth rate of – 0.2 per cent. Bulgaria (-0.6 per cent), Ukraine (-0.5 per cent), Hungary (-0.3 per cent), Romania (-0.3 per cent), Italy (-0.2 per cent) and Belarus (-0.1 per cent) are other major countries with negative population growth rates.
- (iv) **Latin America and Caribbean:** This group of countries includes Mexico and Central and South America along with Caribbean countries. The population of this part of the world has increased 40 times between 1750 and 2017. The population increased from

16 million in 1750 to 643 million in 2017. The population increased 2.4 times between 1750 and 1850. It almost doubled between 1850 and 1900 and again doubled between 1900 and 1950 and again doubled between 1950 and 1975 and further doubled between 1975 and 2017. The population growth rate at present is 1.1 per cent and in 1970s it was around 2 per cent. Migration from Europe has played a significant role in population growth in this part of the world.

- (v) **Anglo-America:** USA and Canada together constitute Anglo America. The population of this part of the world has increased from just 2 million to 362 million between 1750 and 2017. Immigration initially from Europe and later on from all continents of the world has contributed significantly in this increase by 181 times in population. This part of the world is highly urbanized and industrialized and is a resource and technology rich area. The CBR and CDR are 12 and 8 per thousand respectively, therefore natural growth rate is 0.4 per cent. In 2017 the net migration (immigration – emigration) rates were 9 and 3 per thousand in Canada and USA, respectively. Therefore, immigration still plays a significant role in population of North America.
- (vi) **Oceania:** Oceania includes Australia, New Zealand, Papua New Guinea, Fiji, Solomon and islands of Pacific Ocean namely Macronesia, Micronesia and Polynesia. The population of Oceania has increased 21 times from 2 million in 1750 to 42 million in 2017. In the total population of 42 million Australia contributes 24.5 million, Papua New Guinea 8.3 million and New Zealand 4.8 million. Australia and New Zealand are developed countries and others are less developed. In New Zealand and Australia migration from Europe resulted into population growth and both are dominated by European people and western culture. After 1970s migration from Asia has also contributed significantly in their population growth. In 2017 the CBR and CDR in Australia and New Zealand are 13 and 7 per thousand; therefore, the natural increase is 0.6 per cent. Net migration is 8 per thousand in Australia and 3 per thousand in New Zealand.

Conclusion: It took million of years for world population to become 1 billion in 1804 but it doubled to 2 billion within 123 years in 1927. The addition of next one billion to become 3 billion required only 33 years and in 1960 the world population became 3 billion. The next one billion was added within 14 years to make it 4 billion in 1974 and next one billion each were added in just 12 years in 1987 (5 billion), in 1999 (6 billion) and in 2011 (7 billion). At present world population is about 7.5 billion. Agricultural revolution, industrial revolution and medical revolution accelerated the rate of population growth at different points of time. The MDCs

entered into population explosion before LDCs. The growth rates of LDCs in population explosion phase are double the rates in LDCs and duration is longer along with massive size of population. Europe continent has moved to zero growth rate stage but Africa is still passing through population explosion with high growth rates. World population as a whole is passing through late expanding stage of demographic transition and population is increasing with declining growth rates.

References

1. Chandna, R.C. (2015) Geography of Population, Kalyani Publication, New Delhi.
2. Hassan, M.I. (2005) Population Geography, Rawat Publication, Jaipur.
3. Husain, Majid (2011) Human Geography, Rawat Publication, Jaipur.
4. Maurya, S.D. (2012) Human Geography, Prayag Pustak Bhawan, Allahabad.
5. Rubenstein, J.M. (2008) An Introduction to Human Geography: The Cultural Landscape, Pearson Prentice Hall, NJ.
6. United Nations Population Datasheet 2017.
7. United Nations Population Division (1999) The World at Six Billion, New York.

Web Links

<https://ourworldindata.org/wp-content/uploads/2013/05/updated-World-Population-Growth-1750-2100.png>

[https://upload.wikimedia.org/wikipedia/commons/0/03/World_population_percentage_pie chart.png](https://upload.wikimedia.org/wikipedia/commons/0/03/World_population_percentage_pie_chart.png)