Population and Society

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Lecture No. # 15

Demographic Transition in the 19th and 20th Centuries

Friends in this module, we are discussing the nature of population growth in the world as a whole; and this is the second lecture in that series. In the last lecture, I talked about what was the nature of population growth in ancient society, if we broadly divide history of population growth into three periods; ancient society, actually ancient society, and up to beginning of the 19th century, it is more than ancient society. Then 19th and 20th century; today we will talk about what happened during the 19th and 20th century.

And, in the next lecture, we will look more closely at the differences between population trends in developed and developing countries. Why are we specifically talking about 19th and 20th century? The reason is that up to the beginning of the 19th century, the rate of growth of population was very small and fluctuating. That is why as I said in the previous lecture, if man appeared on this planet earth about 5 lakh years ago, then it took 5 lakh years to reach the first billion mark in 1820. In the year 1820, the year 1820 is very important in the history of populations.

In 1820 ad, for the first time world population reach first billion mark, and it is from that point onwards that population growth started increasing. So, today we will specifically look at 19th and 20th century. It is also important to say right in the beginning that in ancient society, the reason why growth rate was fluctuating, and very small. Was that fertility too was not too high as the bonegard showed that the theoretical upper limit of number of children can be 40, if a women can produce a baby between 15 years and 45 years, 15 to 45 is taken to be the reproductive period sometime, 15 to 49 is considered to be the reproductive period.

But, actually the number of children rarely exceeded 7. In hertride tribe of United States at the border of United States and. In this century I mean in the previous century, it total

fertility of 8.9 was observed, and that is believed to be one of the highest ever observed fertility rates in the world.

And the reasons are social, cultural, biological that nearly 25 percent of the reproductive period was not available to women for reproducing because, they are they were either unmarried, or they were widowed divorced separated, or deserted. Then some part was not available to them because, there were sterile. So, fertility rarely exceeded 8 or 9.

Mortality was perhaps not always high but it fluctuated, if it is normal year then perhaps mortality was as low as it is today or may be lower sometime but, periodically due to epidemics, natural catastrophe, excessive rainfall, or shortage of rainfall I mean floods and famines, and wars violence, attack by wild animals, and lack of transport and communication death rates must have reached very high levels.

In the known history, we know that when in Europe plague broke out in certain cities in a small period of time say 1 month or 2 months time. 25 percent to 50 percent of the whole population was wiped out by bubonic plague. So, if 50 percent population is wiped out that means death rate is around 500. So, in some years, normally death rate would be low but, in some years as in epidemic years death rates could go up to 80, 90, 100 or may be in extreme cases even 500 as the history of European cities affected by bubonic plague shows.

So, because of this periodic high death rate, and birth rate of around 50 per 1000 or total fertility rate of around 7 or 8 children, for much of the period in human history our population remained stationary, now let us see what happens in 19th and 20th century.

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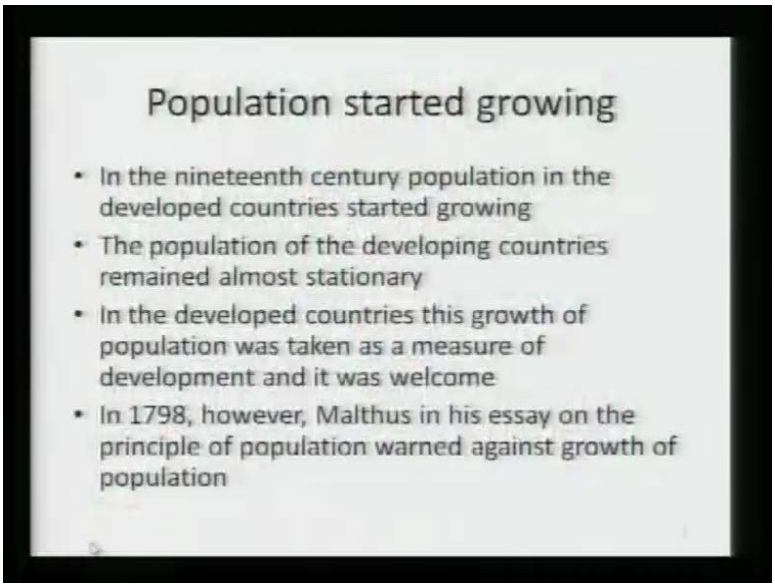

Now, in 19th the century, population is started growing. In the 19th century, population in the developed countries stated growing fast. In developing countries it remained stable, the population of the developing countries remain almost stationary. I will explain, what do I mean by developed and developing countries. In the developed countries this growth of population was taken as a measure of development and it was welcome.

That means, initially a positive or a high rate of growth of population was considered to be an indicator of development, it was not like today's situation in which we associate rapid population growth with underdevelopment, or un-development, or backwardness, or poverty, or rigid stratification system. In the beginning when population stared growing fast in the developed countries, then rapid population growth was seen as a sign of economic development because, it was in economically developed countries that population was growing.

In 1798 however, Malthus in his essay on the principle of population warned against growth of population. When everybody was happy when everybody was happy that population is growing and it is a good thing, it shows economic development, it shows decline in wars and conflicts, it shows agricultural expansion and it shows overall improvement in productivity. It was Malthus who said, that be careful and rapid

population growth can lead to vice and misery because, according to him population can grow faster than the means of subsistence available.

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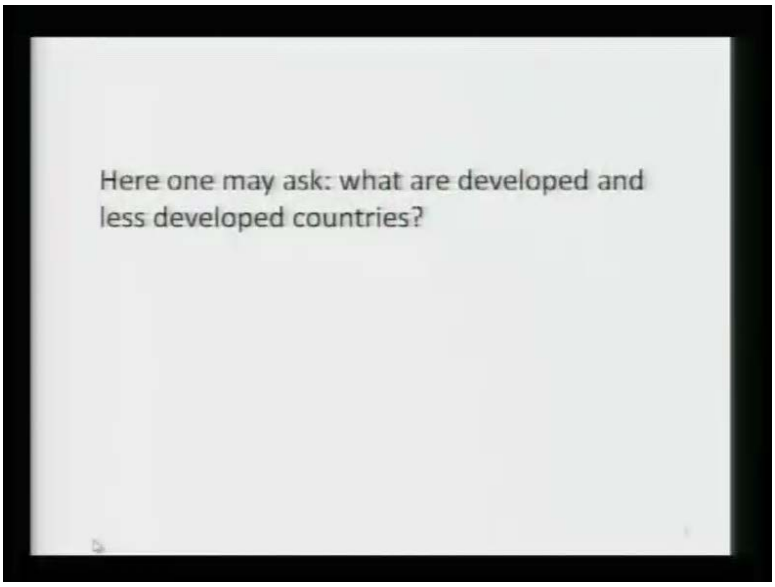

Here one may ask, what are developed and less developed countries? I say that in developed countries the population growth started first, and then in developing counties it followed. What are developed and developing countries, this category, many people have classified countries into developed, developing, affluent, poor, Northern, Southern or eastern, Western but, I am using the classification of United Nations.

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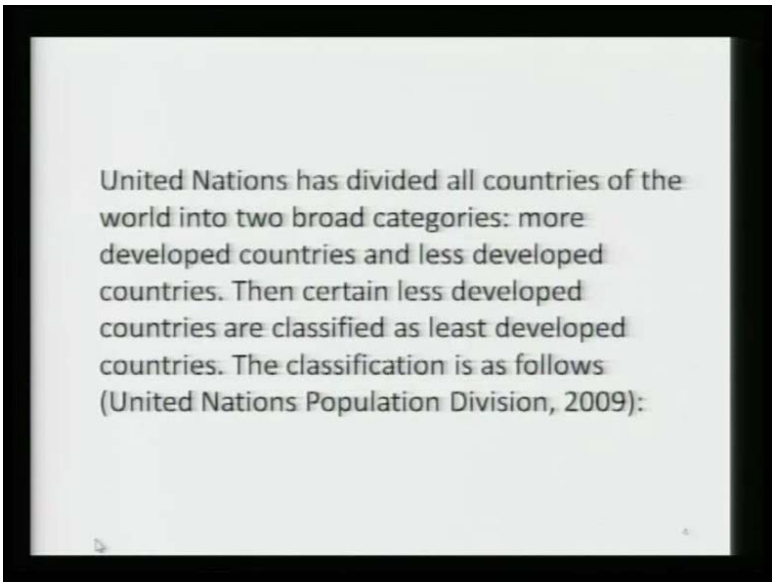

United Nations has divided all countries of the world into two broad categories, more developed countries and the less developed countries. Then in the category of less developed countries certain countries are classified as least developed countries. The classification is as follows.

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More developed regions they comprise all regions of Europe plus Northern America, Australia, New Zealand and Japan.

So, all the countries of the regions of Europe, Northern Europe, Southern Europe, the whole of Europe plus Northern America or United States, Australia, New Zealand and Japan; countries of these regions are called developed countries. And less developed countries are; countries of the regions Africa, whole of Africa, whole of Asia except Japan. Japan is considered to be part of the developed countries. Latin America the whole of Latin America and the Caribbean, plus Melanesia, Micronesia and Polynesia; all these countries are considered to be less developed countries.

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In the category of less developed countries broadly in the so called third world countries Asia,Africa and Latin America, a few of them are removed from the category of less developed countries like Japan, but broadly Asia, Africa, Latin America this is undeveloped or developing and Europe and Northern America are and Australia and New Zealand they are developed.

In the category of developing or less developed countries there are, 49 countries which are further classified as the least developed countries of the world. These are the names of those countries Afghanistan, Angola, Bangladesh there are several countries of you can see south Asia also which are part of the least developed countries Nepal is one Bangladesh is another country, in Asia then Bhutan is part of least developed countries. Then of this 49 country, 33 are in Africa, 10 in Asia, So, it is mostly African countries which are least developed countries; 10 of them are in Asia and 1 country is in Latin America and the Caribbean and 5 in Oceania.

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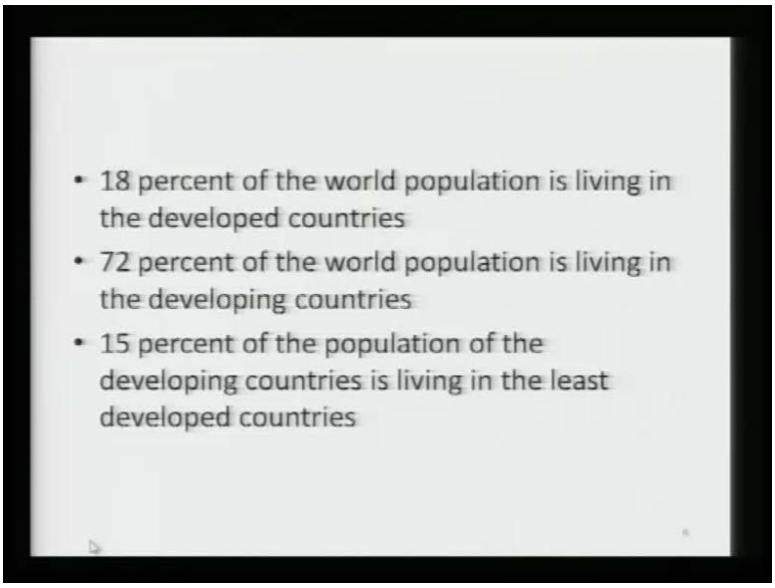

In terms of composition of population of the world, 18 percent of the world population is living in the developed countries, and 72 percent of the world population was is living in the developing countries. You see in the first lecture, I said that in the beginning of the christian era around much more than like today 18 percent of the world population is living in the developed countries, at that time a much higher figure than 18 was living in the developed countries but, what has happened that over the years proportion of developing countries is increasing.

72 percent of the world population is living in the developing countries. 15 percent of the population of the developing countries is living in the least developed countries.

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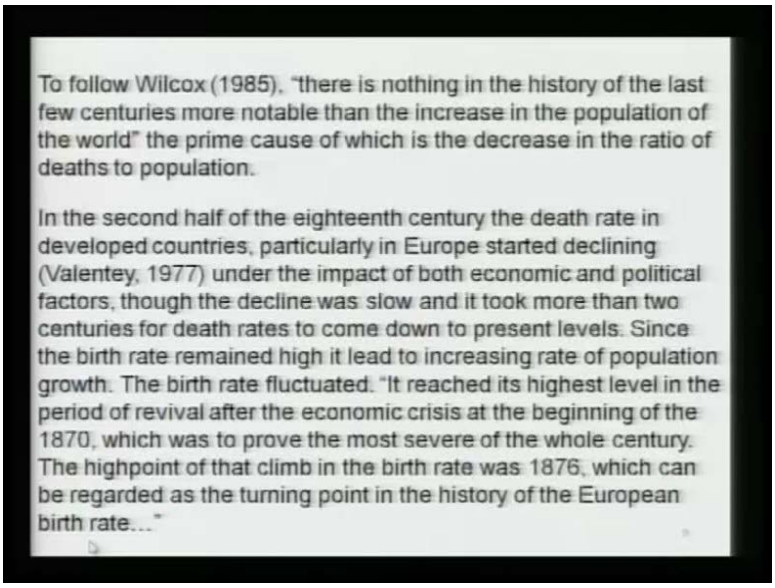

To follow, Wilcox there is nothing in the history of the last few centuries more notable than the increase in the population of the world. The prime cause of which is the decrease in the ratio of deaths to population, deaths to population ratio means death rate due to decrease in death rate.

In the second half of the 18th century the death rate in developed countries, particularly in Europe started declining, first in North Western European countries and then in the other parts of the Europe. Under the impact of both economic and political factors. Though the decline was slow and that is why we say that population is stared growing mostly in the 19th century in 18th century although it is started , but this growth was very slow.

And it took more than two centuries for death rate to come down to present level since, the birth rate remains high; it led to increased rates of population growth. The birth rate fluctuated. It reached its highest level in the period of revival after the economic crisis at the beginning of 1870, which was to prove the most severe of the whole century. The high point of that climb in the birth rate was 1876, which can be regarded as the turning point in the history of European birth rate but, let me say that these fluctuations in birth rate can be ignored when, we are looking at the growth rate of population overall because, fluctuations in birth rates were never so significant as the fluctuations in the death rate.

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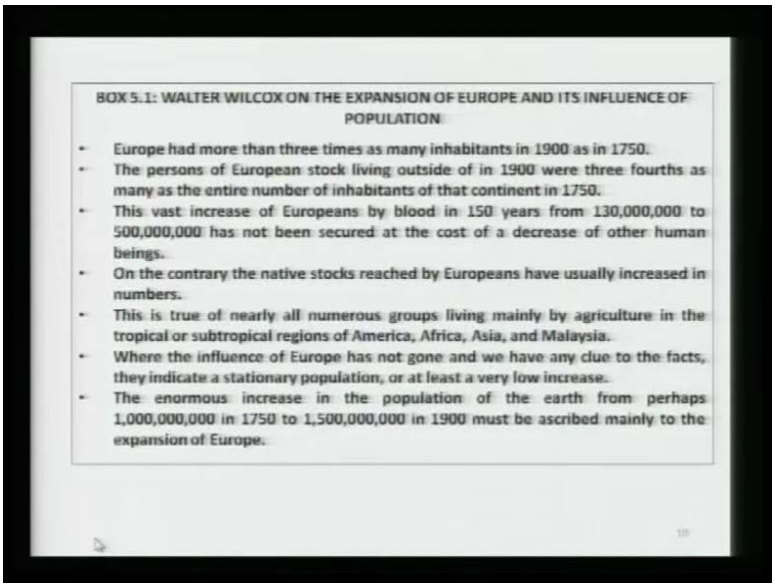

Walter Wilcox on the expansion of Europe and its influence of population says the follows, Europe had more than three times as many inhabitants in 1900 as in 1750, means in you know in a gap of 150 years they are saying that Europe had more than three times you can calculate what must have been the rate of growth of Europe during this time, using your p t equal to p 0 e raisefor r t it was a very small figure but, if still Europe increase from 1750 to 1900 in 150 years three times.

Now, when we compare today's growth rate of population like in the last century in India, in just 100 years time the population of India became four times. Here during a period of rapid population growth in Europe from 1750 to 1900, in 150 years time Europe's population became three times, as said by Walter Wilcox but, in India in 100 years time; in the last century population became four times, that means during the period of rapid growth in Europe, Europe did not grow so fast, as subsequently in the countries in the category of developing countries increase.

Then the persons of European stop living outside of Europe in 1900, were three fourth as many as the entire number of inhabitants of that continent in 1750. That means European population increase and that led to migration and settlement of European people in all parts of the world, outside Europe This vast increase of Europeans by blood in 150 years, from a very large figure, nearly 130,000,000 to 500,000,000 has not been secured at the

cost of the decrease of other human beings means wherever, Europeans went their population expanded but, simultaneously population of other also expended.

So, it was not at the advisable, it was not because of any conflict or because, of genocide or something. European population increase; population of natives also increase. Wilcox may be trying to suggest that there was some kind of civilizational effect on others and as civilization spread population of other countries too, expended. On the contreid the natives stocks reached by Europeans have usually increase in numbers.

This is true of nearly all numerous groups, living mainly by agriculture in the tropical or subtropical regions of America, Africa, Asia, Malaysia where the influence of Europe has not gone and we have any clue to the fact may indicate a stationary population. All those less developed countries, where European influence was not seen which remains the outside colonization, their population remains stationary. And the enormous increase in the population of the Earth from perhaps. 1 billion in 1750 to 1.5 in 1900 must be ascribed mainly to the expansion of Europe.

This is Wilcox says one estimate not all everybody will agree with this estimate but, the point is which will be acceptable to most, that during this time beginning 18th century and in 19th and 20th century population of Europe started increasing. Population of settlements of Europe started increasing and that was not at the cost of natives.

And the population of those countries, which according to Wilcox remain uncivilized because, they were not reached by European their, population remain stationary.

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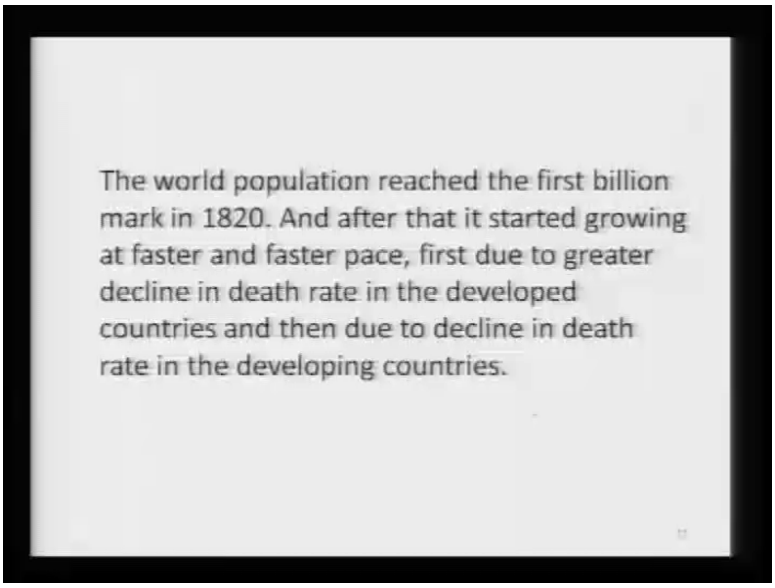

The world population reach the first billion mark in 1820 and after that, it is stared growing at faster and faster pace. First due to greater decline in the death rate in the developed countries and then due to decline in death rate in the developing countries.

So, the growth of population in 19th and 20th century is not because of any increasing fertility. Fertility did not increase, as a matter of fact in many country's fertility started declining. In countries like Francem, reduction in death rate and reduction in birth rate was almost simultaneously but, in other countries too with sometime birth rate decline. So, it was not because of increase in birth rate but, because of decrease in death rate that population started growing.

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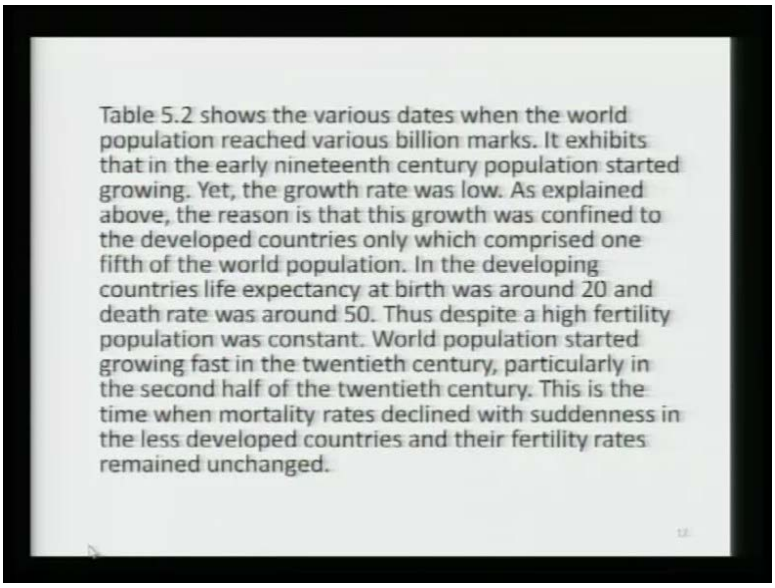

I will show you a table, in which various dates are mentioned when the world population reach second, third, fourth billion marks. It exhibits that in the early 19th century, population started growing yet the growth rate was slow. And as explained earlier the reason is that the growth was confined to the develop countries, in which say one quarter of the whole world population lived.

When the growth started beginning in less developed countries, where three fourth or three quarter of world population lived obviously its impact on the population growth rate of the whole world was much more. In the developing countries life expectance life expectancy at birth was around 20 and death rate was around 50. In our country also only 100 years ago, in the beginning of the last century our birth rate was around 50 and our life expectancy was around 20s. There are estimates that it was around 22 years but, subsequently under the effect of influenza epidemic around 90, 18 life expectancy declined to nearly 20 years.

The despite the high fertility, means a birth rate of 50 and total fertility rate of 7. And world population started during growing fast in the 20th century; particularly in the second half of that 20th century. This is the time when mortality rates decline with suddenness in the less developed countries and their fertility rates remain unchanged, if you closely look at the history of decline in death rate, in what happened in Europe in nearly 300 hundred years time, from the beginning of 18th century beginning of say 21st

century, what happened in 300 years time, very close to that happened in just a decade or two decades in less developed countries.

In a typical case of this rapid decline in death rate, in Srilanka around 1945 death rates declined by nearly 50 percent in just one year time and that was due to spread of ddt and control of malaria.

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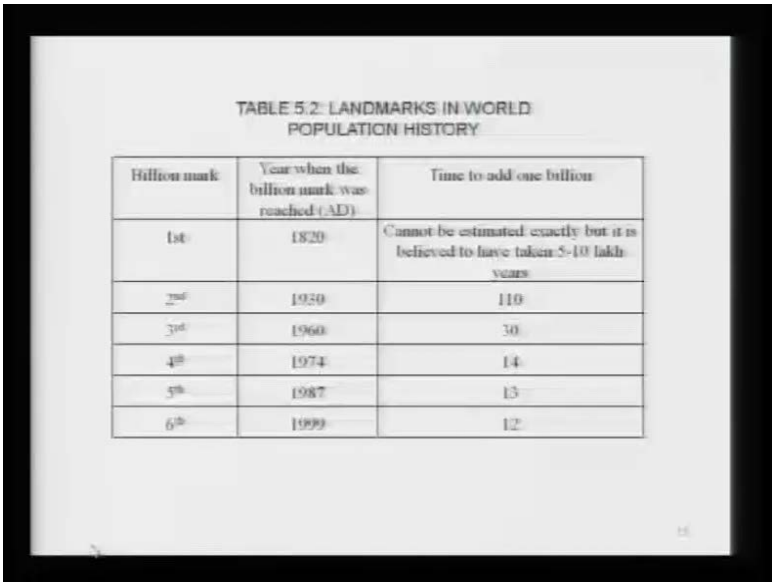

So, let us look at this table. So, the first billion is reach in 1820 and how much time the world population took to reach first billion mark 5 to 10 lakh years, the most conservative estimate would be 5 lakh.

So, it took 5 lakh years to reach the first billion mark and when was the second billion reach in 1938. In just 110 years time the second billion was added to the population growth, the third billion was added, you know or the third billion was reached in 1960 in only 30 years time. In only 30 years time between 1930 and 1960 the world population increase from 2nd billion to 3rd billion.

Then world population in just 14 years time, after that in 1974 the world population reach 4^{th} billion mark and after that it took only 13 years to reach the 5th billion mark and then only 12 years to reach the 6th billion mark in 1999. See the rate at which population started growing in the 20th century, that is why population became an issue.

In one of my lectures I was saying that initially in writings of intellectual, philosophers, economist, you do not find much mention of population in 18 century. Even in the beginning of 19th century not much is discussion on population, except that Malthus wrote a sensational essay and people started reacting to that. And that was because the population was not growing at all or it was growing at such a slow pace that population itself would not affect the socioeconomic political and demographic other demographic trends.

So, the writings of philosophers intellectuals and social scientists are silent on the matter but, when population stared growing, so fast that it takes only 110 years and then only 30 years and then 14 years then 13 and only 12 years to add 1 billion; it took 5 lakh years to reach the first billion mark but, between 1987 and 1999 it takes only 12 years time to add another billion.

So, this is the time when population growth is effecting all calculations of planners in terms of productivity, employment, poverty, inequality, opportunities standard of living. And population becomes a major issue population becomes a very major issue in the second part of 20th century, when you see that addition of 1 billion is taking less than 25 years.

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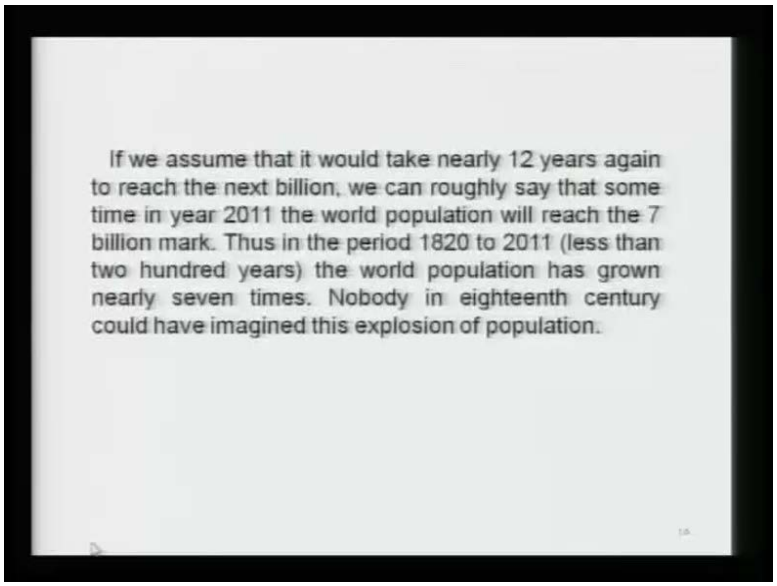

If, we assume that it would take nearly 12 years again to reach the next billion, we can roughly say that some time in near 2011 means next year the world population will reach

the 7 billion mark. Thus in the period 1820 to 2011 less than 200 years time, the world population has grown nearly seven times. 200 years seven times nobody in 18 century could have imagined this explosion of population.

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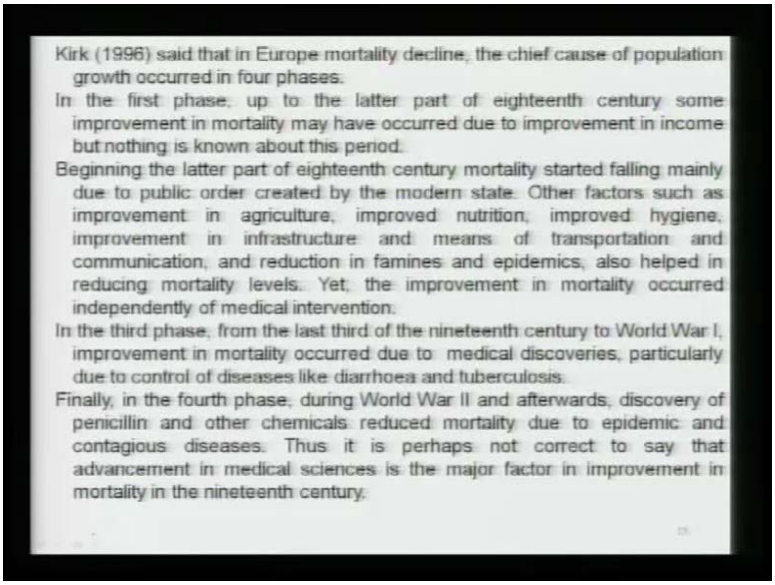

Kirk said that in Europe mortality decline, now the issue is then why did this happen, why did not mortality decline. There are many theories, in the first phase up to the latter part 18th century some improvement in mortality, may have occurred due to improvement in income but, nothing is known about this period.

Beginning the later part of 18th century, mortality started falling mainly due to public order created by the modern state, means it was a political cause rather than medical. Other factors such as improvement in agriculture, improvement in nutrition, in hygiene, in infrastructure, improvement in transport and communication and reduction in famines and epidemics also helped in reducing mortality levels. Yet the improvement in mortality occurred independently or medical interventions.

The moment we talk about mortality or improvement of mortality, immediately our attention is drawn to improvement in medical sciences or spread of health structure but, as a matter of fact the mortality was declining in the European countries or in today's developed countries. Health improvement in the sense of advances in medical sciences or expansion of health and infrastructure did not play very significant role.

It was improvement in income, transport, communication, labor laws, improve labor laws. Better organization of work and perhaps political factors, rise of nation states leading to cattlement of conflicts or wars between small countries or nations or kingdoms that was the major cause of improvement of mortality.

In the 3rd phase from the last third of the 19th century to world war first, improvement in mortality occur due to medical discovery, now medical discovery is in antibiotics, sulfur drugs sulfonamide, penicillin you know particularly due to control of diseases like diarrhea and tuberculoses. Now it is the time when improvement in mortality occurs due to medical reason.

Finally, in the fourth phase during world war second and afterwards discovery of penicillin and other chemicals reduce mortality due to epidemics and contagious diseases. Thus it is perhaps not correct to say that advancement in medical sciences is a major factor in improvement in mortality in the 19th century.

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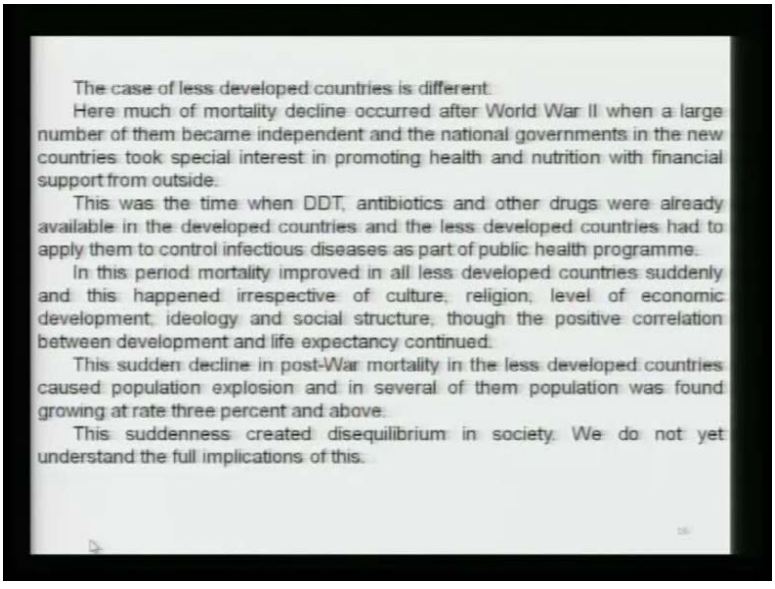

Ten 20th century years but, not 19th century. In the case of less developed countries is different. Here much of mortality occur after much of mortality decline occur after world war second, when a large number of them became independent countries of Asia, Africa, Latin America they became independent national government were formed. And they took special interest in promoting health and nutrition, with financial support and knowledge support from outside this was the time when DDT antibiotics and other drugs

were already available in the developed countries and the less developed countries had to apply them to control infection diseases as part of their public health program.

In this period, mortality improved in all less developed countries suddenly and this happen, this sudden decline in death rate happen irrespective of culture, religion level of economic development, ideology and social structure.

In the previous lecture, somebody had asked what is the role of socio cultural factors in population growth, I did not discuss socio cultural factors. But you see in ancient society socio cultural factors were of very little importance death rates were universally high and fertility rates were around seven or eight in decline in death rate in less developed countries. In the last century after 1950 or after Second World War. Again socio cultural factors played a very little role because death rates declines suddenly in all countries Hindu, Muslim, Christian irrespective of religion; irrespective of language; irrespective of whether. They were poor or rich in Asia in Africa, Latin America everywhere death rates started declining.

Some correlation between death rate and economic development remained no doubt but, death rates declined in all less developed countries. The sudden decline in post war mortality in the less developed countries caused population explosion and in several of them population was found growing at rate 3 percent and above three you see when a population grows at rate 3 percent then the doubling time is 23 years. In 23 years time population doubles.

This suddenness created disequilibrium in society. We do not yet understand the full implications of this what is the impact of population on society.

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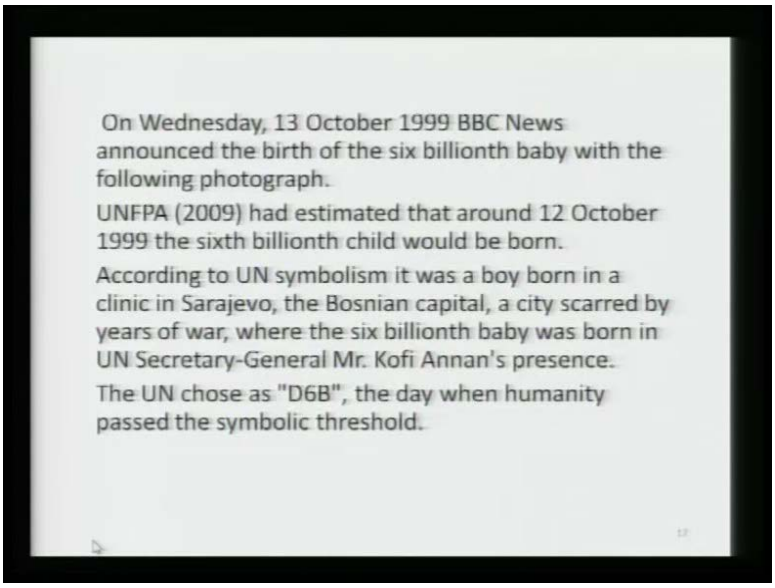

Just to mention about this 6 billion thing, because it made News on Wednesday 13th October 1999 BBC News announced the birth of the sixth billionth baby with the following photograph. I will show you the photograph UNFPA had estimated that around 12th October 1999 the sixth billion child would be born.

According to UN, it is a symbolism it was a baby boy born in a clinic in Sarajevo the Bosnian capital, a city scarred by years of war, where the sixth billion baby was born in UN Secretary-General Mr. Kofi annan’s presence. The UN chose as D6B, the day of 6 billion D means, day 6 B 6 billion. The day when humanity passed the symbolic threshold of six billion.

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This is the picture that was released by United Nations. UN chief welcomes sixth billionth baby. Baby with her mother in Sarajevo.

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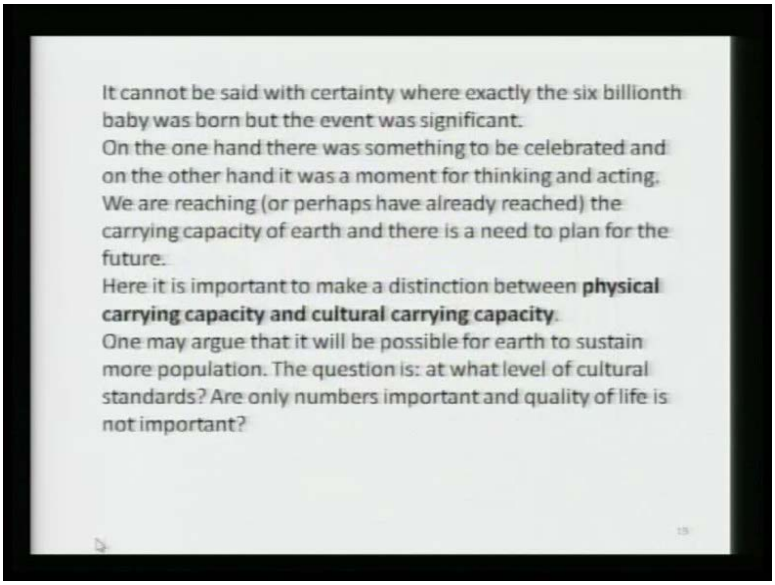

It cannot be said with certainty where exactly the six billionth baby was born every minute every second children are born in various parts of the world. And we cannot exactly identify, it was a symbolic event that UN general secretary was present. They

chose it to be less developed country a war torn country, a country part of that region in which rate of growth of world population is high.

Today families can say why did United Nations chose to chose a baby boy to celebrate sixth billion, why not a girl child. So, these are matters of interpretations but, the point is that we reach six billion. On that day or around that time. There was something to be celebrated and on the other hand, it was a moment for thinking and acting. We are reaching or perhaps have already reached the carrying capacity of earth and there is a need to plan for the future, how long can we grow?

Although this question was always pose in the past for last 200 years [FL] can we afford to grow more. When we reach second billion, third billion, always this question was asked. And we added another billion. Now when we reach six billion this question was asked what is our carrying capacity? can we add one more billion? We have already added nearly one billion in the next year, we will be reaching seven billionth mark but, yes it is a serious issue and more time passes more we reach seventh or eighth more this issue becomes significant.

Here it is important to make a distinction between physical carrying capacity and cultural carrying capacity. May be somebody can say that this earth has food or subsistence, even for ten billion. We are reaching only seven billion mark perhaps ten billion people can survive but, does mankind look for survival only or for survival with a decent living standard.

So, carrying capacity physical carrying capacity how many people can be supported by mother earth this is one thing. And if we consider survival with some minimum standard of living some decent standard of living, then the complex of this question changes then we are talking of cultural carrying capacity. May be the earth has physical capacity physical of supporting ten billion but, at what standard we do not want ah earth to support ten billion at the standard of Bangladesh. Everybody wants to have standards of United States.

So, can the mother earth support ten billion at the standards of United States? that takes us to the issue of cultural carrying capacity. One may argue that it will be possible to for earth to sustain more population, the question is at what level of cultural standards are only numbers important? And quality of life is not important at all ?

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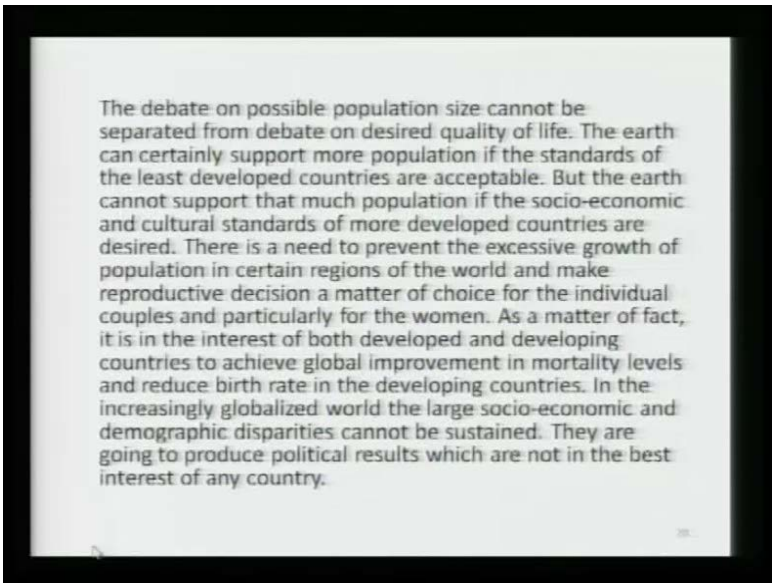

If, quality of life is also important then the carrying capacity would be much less.

So the debate on population size cannot be separated from debate on desired quality of life. It is a in the interest of both developed and developing countries to achieve global improvement in mortality level and reduce the birth rate, we cannot have a policy of raising death rates to curve population growth, we want death rates to reduce further but, we want to control growth rate by reducing fertility rate.

Before you ask some question let me also show one or two slides on international migration this is another issue.

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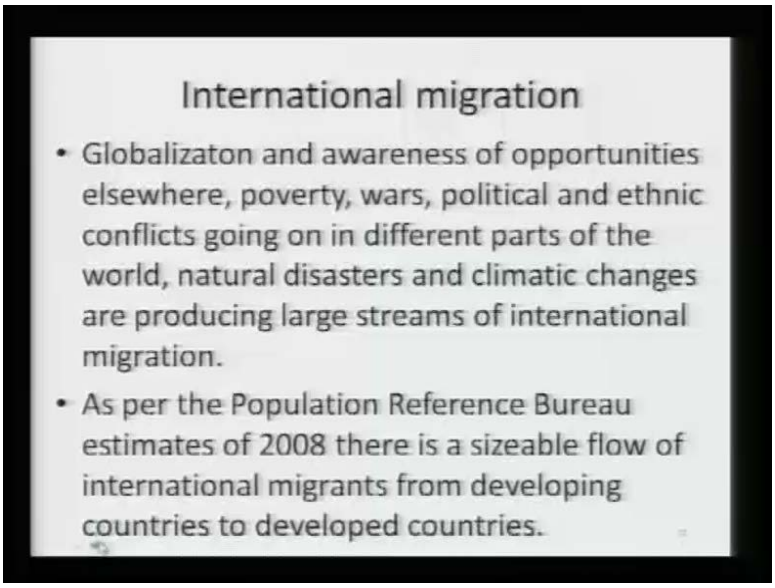

Globalization in awareness of opportunities elsewhere, poverty, wars, political and ethnic conflicts in different parts of the world, natural disasters and climatic changes are producing large streams of international migration. There is a sizeable flow of international migrants mostly from developing countries to developed countries.

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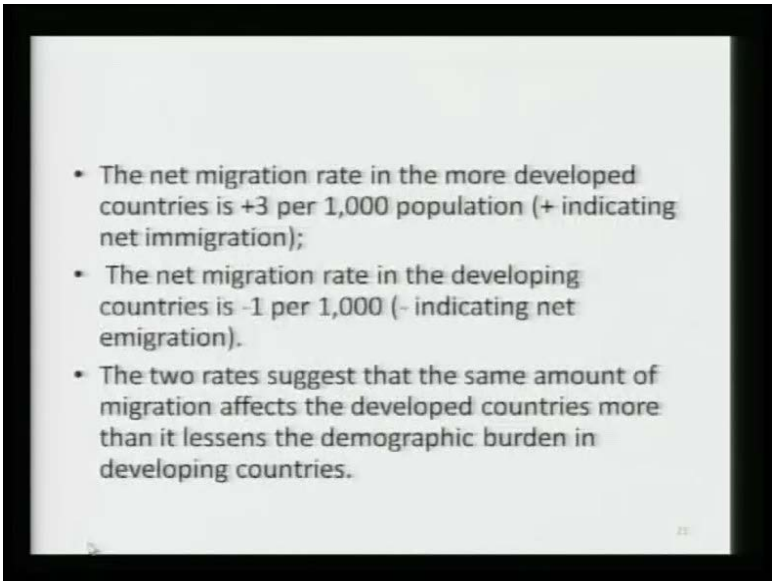

In terms of rate the net migration rate in the more developed countries is 3 per 1,000 plus 3 indicates net immigration, there is both immigration and emigration, net is plus 3 means net immigration. Immigration is more than emigration and the net migration rate

in the developing countries is minus 1. The 2 rates suggest that the same amount of migration affects the developed countries more than the it lessens the demographic burden in the developing countries.

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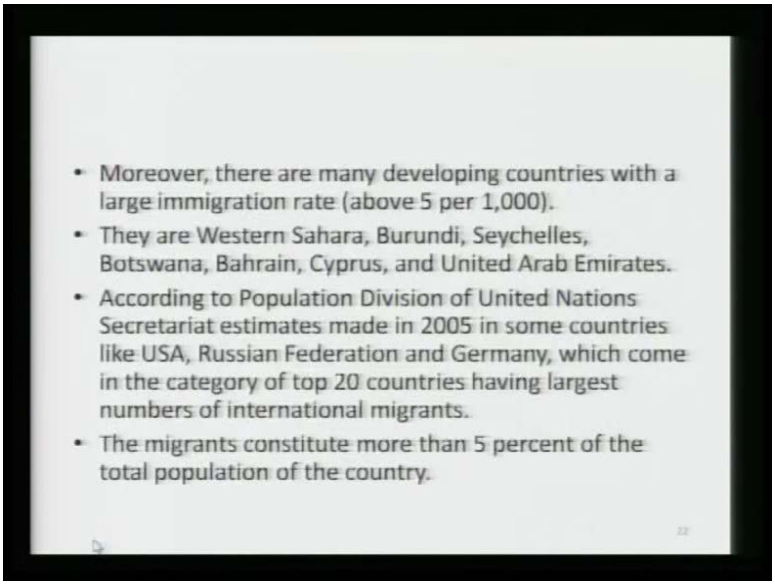

Moreover, there are many developing countries with a large immigration rate above 5 per 1,000. They are Western Sahara Burundi Seychelles Botswana Bahrain Cyprus and United Arab Emirates. According to population division of United Nations secretariat estimates made in 2005, in some countries like USA Russian federation and Germany, which come in the category of top 20 countries having largest numbers of International migrants. In some countries the developed world according to population division of United Nations in 2005 there were more than 5 percent of immigrants the countries are USA, Russian federation and Germany which come in the category of top 20 countries having the largest numbers of international migrants.

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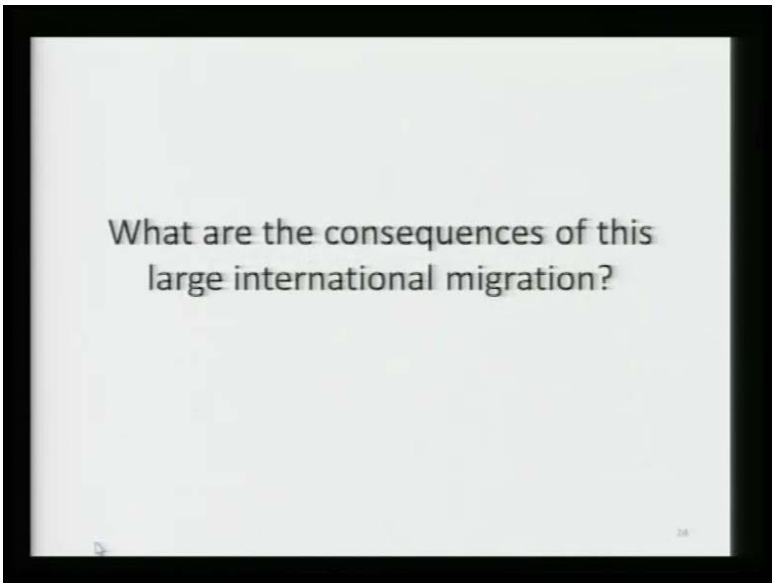

You can imagine what are the consequences of this large international migration.

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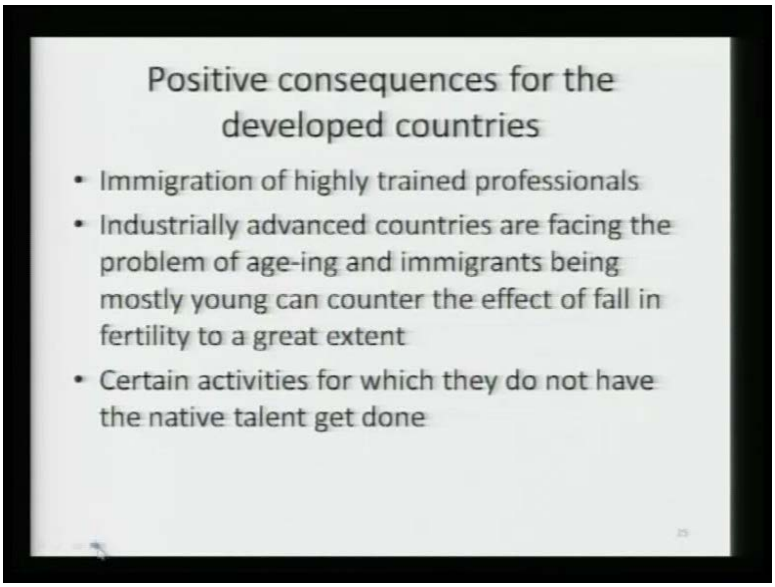

In developed and developing countries, there are positive consequences as well as negative consequences among positive consequences for the developed countries are immigration consist of highly trained professionals that is why they welcome migrants. Industrially advanced countries are facing the problem of ageing and immigrants being mostly young can counter the effect of fall in fertility to a great extent and then certain activities for which they do not have the native talent get done.

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There are negative consequences effect on employment, effect on culture, language, religion and migrants posing a threat to their traditions and customs social diversity; lack of loyalty to history and tradition where lot of migrants come from other countries.

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And great as surveillance requirement, for developing countries also there are negative and positive consequences positive consequences are lessening of population pressure, remittances, knowledge transfer, voice in the developed countries modernization and investments by non-resident countrymen new ideas.

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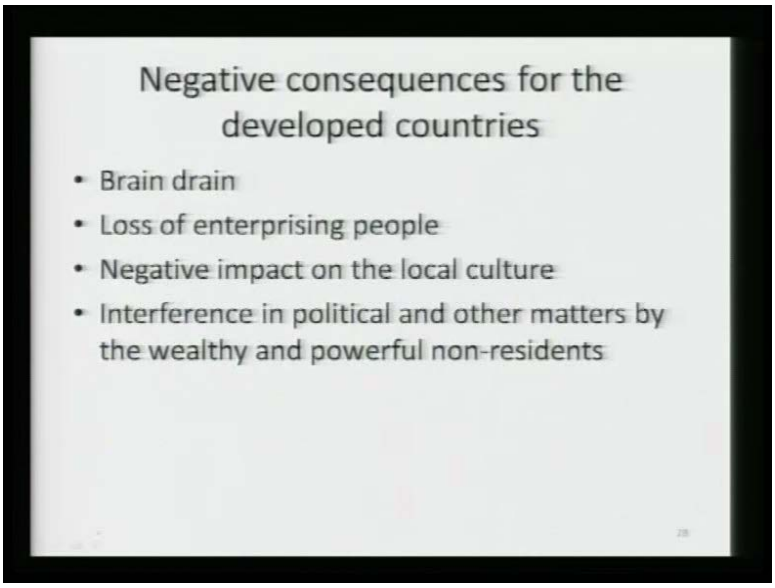

Negative consequences are brain drain, everybody talks of brain drain in less developed countries. And the loss of enterprising people young able body productive and negative impact on the local culture, part of globalization, localization and interference in political and other matters by the wealthy and powerful non-residents.

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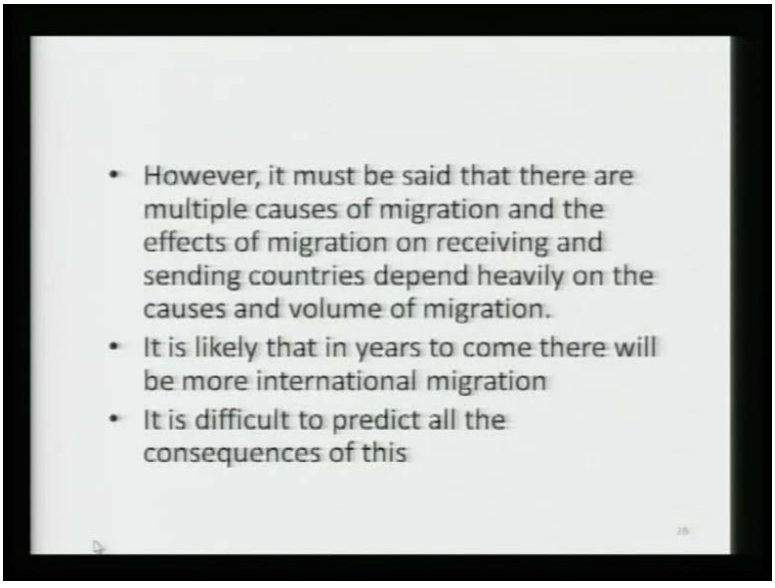

However, it must be said that there are multiple causes of migration and the effects of migration on receiving and sending countries depend heavily on the causes and volume

of migration. It is likely that in years to come there will be more international migration and it is difficult to predict all the consequences of the.

Sir, thank you sir the, presentation was so interesting and informative. Actually I have two doubts, first of all the regarding with the concept of fertility, in your presentation you mentioned about total fertility rate something. I am not familiar with the concept of fertility rate that is the number of children produced by women in the reproductive age, what is the different between fertility rate and total fertility rate? that is.

Second question is regarding with the relation between population and development, you also mentioned that population is considered as a indicator of development but, now we know that population is considered as a hurdle for development especially in the least developing countries but, in the same time countries like Scandinavian and European countries are also facing the scarcity of manpower, is there any concept of in the sense optimum population optimum population for India or optimum population for Europe for America?

Ok thank you, regarding your first question, see this fertility is measured in terms of both birth rate and total fertility rate. Birth rate means number of children born per year per thousand populations, the upper limit of birth rate as usual will be in around 50 per thousand. In most country their fertility was high birth rate was around 50 and total number of children as I told you that in was in hertride population a tribe of United States, at the border of United States and Canada. The total fertility rate or the average numbers of children produce in entire lifetime by a women, average women was 8.9 around 9 children.

There have been some women, who have who are known to have produced even 15 children but, on the average in a population 9 has been perhaps the upper limit but, in most population when we talk of higher fertility levels with have something in mind like 7 children. In the last lecture, I said that in U. P in 1972. Our IT Kanpur itself conducted a large survey and in rural areas of U.P average number of children was found to be eight. So, this is regarding the difference between birth rate and fertility.

Today birth rate in several developed countries has come down to a level of seven or eight and total fertility means average number of children in entire lifetime has gone below 1.5. That is why they are suffering from ah what they call population implosion.

On the other hand we are facing population explosion, excessive growth of population, could you repeat your second question.

If consider population nearly

Population and development. In the beginning when in the beginning in late 19th century and early part of 20th century, when people were happy the population is increasing that was because so far population was constant and population was constant was largely because of high death rate. So, when population started growing due to reduction in death rate obviously, something good was happening economic development, industrialization, political stabilization, means reduction in wars conflicts violence homicide suicides.

So, people felt happy that something good is happening. And death rates declines at such a slow pace that I had told you, it took more than 200 in some cases 300 years for death rates to decline form level of 50 to level of 10. So, that was ok, what happened in the less developed countries. So, in that that is why in the developed countries they say they found population growth to be an asset for them at that time.

They also find population to be an asset today, because their total fertility rate has gone below replacement level and they are most of them are suffering from what we call ageing of population proportion of people in older ages is increasing 60 plus 80 plus and proportion of 80 plus among 60 plus they are suffering from ageing of population.

So, at a time when they are facing population implosion for them population is an asset even today in our countries in less developed countries population started growing at a very fast rate after second world war and that was largely because of sudden control of infection diseases like plague, cholera, malaria, diarrhea, dysentery, infection diseases, tumor sclerosis and the time that while developed countries took 300 years time to reduce their death rate from 50 to 10 less developed countries took only some countries took 10 years, some 20 years, 30 years to bring about the same order of change in death rate, so suddenly their population stated growing.

In the in developed countries when population grew even during the peak period their rate of growth never exceeded one percent. So, they did not face the so called negative consequences of population, less developed countries when they were growing in the

second part of the last century because of sudden reduction in death rate several countries were growing at rate three percent per year some countries were growing even at four percent per year.

So, it was this unprecedented increase in the rate of growth of population leading to sudden increase in requirements for satisfying consumption requirements and this was also the time when they became independent and they required money to be invested in economy, so that their rate of growth of income increases.

And the connection was seem to be negative because to grow rapidly in economic sense you require more investment the investment come from saving and to have more saving in a country you must have lesser consumption when population is growing fast you need more to satisfy the consumption requirement of already large population and then requirements of the growing population.

So, the money is less the saving is less you remember you know when our country became free in the beginning during the first 5 year plan period. What was our rate of investment? Hardly 5 percent. We need an investment rate a poor country like ours needed an investment rate of around 25 percent, so that we could grow at respectable rate of growth but, there was no money.

So, when population is rising at such a fast rate and there is very little to invest in the national economy, so that is why a negative connection between the two population and development was same.

I think in developing countries are of the total population. I think it is around 7 billion 6 or 7 billion. I do not know exactly the figure, so which continent is more? I think Asia is Asian.

Yes, India and china.

I think itis around forty

Yes, in population china is the largest country of the world followed by India and they have projection that because china throw its one child policy has already reduced its growth rate and India’s growth rate is still quite high 1.7 percent per year. So, there are projections that if these trends continue then after a gap of certain number of years that

years depend on our assumptions regarding growth differentials but, may be after thirty years or forty years population of India will become larger than the population of china.

So, then population of India would be the largest population of the world.

Somewhere I have read that now in Africa the population is decreasing because they have mention that I don't know exactly the reason HIV aids they sight is the reason population growth is decreased I don't know.

Actually there is some misunderstanding about this issue as such growth rate of Africa is quite high when somebody makes a statement like you are saying that due to HIV their population is declining population is not declining as such, but their life expectancy could have been much more, and their growth rate could have been much more if they did not have HIV; not all African countries, but there are some African countries in which up to 20 percent of the total adult population is HIV positive; and demographers have estimated, what is the impact of this 20 percent HIV on the life expectancy of those countries.

But there may be other African countries, where HIV prevalence is not even 5 percent. So, it depends HIV is such an issue that because there is no cure for HIV, we can only prevent it; and if proper preventive measures are not taken, then HIV can spread like an epidemic; that is why sometime exaggerated statements of this kind are made. But due to HIV African population is not declining of course, their life expectancy could be much more, if they did not have HIV; thank you.