Population Studies
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Lecture - 04
Population growth

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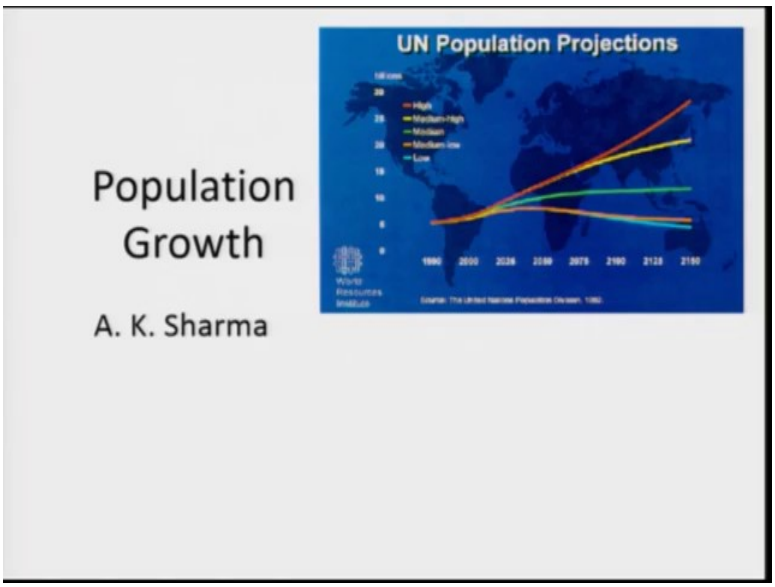

Well, friends. Now, we focus on the growth of population in the world and its consequences for development. I will make two presentations on this. This presentation shows the figures of rate of growth of world population and takes a sort of Malthusian view that population growth is not good for development and for showing this, I am using two theories. One Coale and Hoover and another Optimum Population theory and in the next presentation using Julian Simons theoretical framework, I will show that population can have good consequences also.

Now, this figure shows that in 2019, the world population is around seven point something billion and according to forecasts made by United Nations in 2150, the world population may be somewhere between say 5 billion and more than 25 billions. What actually will happen that depends on the future prospects of fertility, mortality and that depends on the institutional changes in societies and socio-economic development levels.

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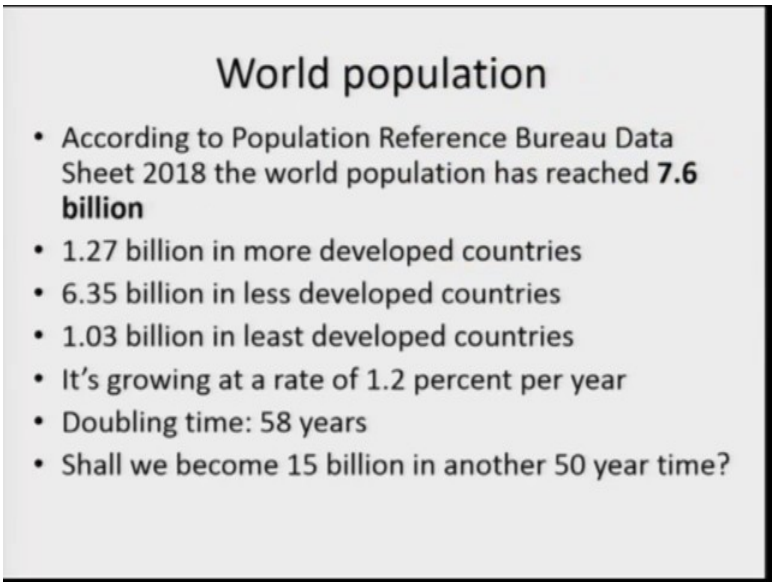

Now, according to Population Reference Bureau Data, the world population has reached 7.6 billion in 2018 and of this 1.27 billion lives in more developed countries; 6.35 billion in less developed countries; 1.03 billion in some country which are called least developed countries and most of these countries belong to sub Saharan Africa. If a population is growing at 1.2 percent per year which is the rate of growth of population of the world, it will take 58 years to double and so, it can become 15 billion in just 50 years time, but this is not going to happen.

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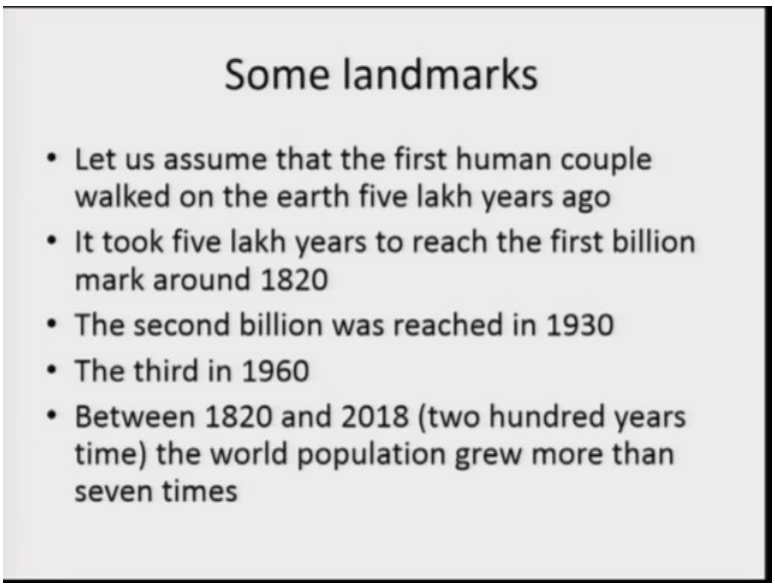

Now, some landmarks for suppose we say that the homosapien walked on this planet earth around 2 million years ago, then initially human population grew very very slowly and it took two lakh years to reach one billion mark in 1820 and then, in 130 years, in 1960, it reached three billion and between 1820 and 2018, the world population grew more than seven times.

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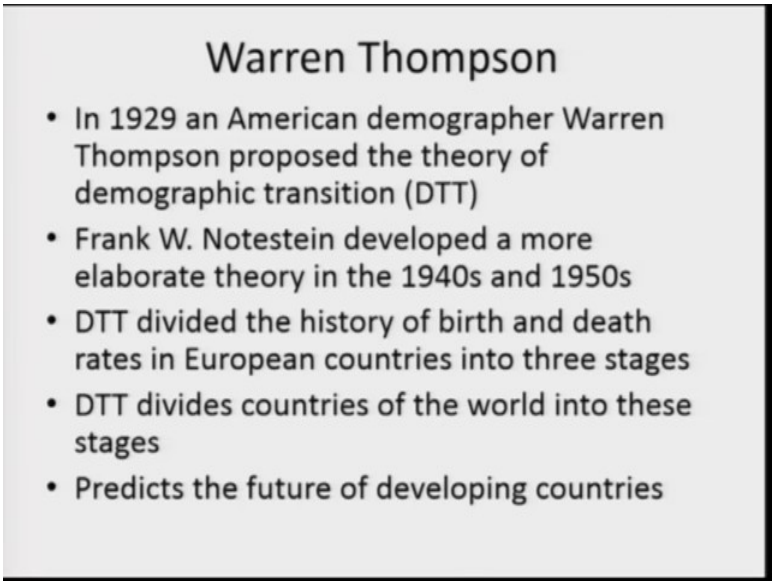

To explain this growth rate why initially population grew at a very very slow pace and why after 1820, world population started growing at a very fast rate and especially exploded in 1950's 60's. There is a theory called demographic transition theory. Let me just summarize this theory and then, show the slides. According to demographic transition theory, initially in ancient society both death rates and birth rates were high and they fluctuated from year to year.

Now, after that with socio economic development, industrialization, improvement in labour laws, rise of nation states, education, hygiene and sanitation, awareness, discovery in medical sciences and so on. Death rate starts declining. Now, death rates started declining first in the developed countries about 300 years ago. So, the developed population double population of the developed countries started rising; but since there both birth rate and death rate declined more or less at the same time and it took almost 250 years for them to decline to low levels, they did not experience population explosion.

The fact that in 1821 population reached first billion that is more because of growth of population in the developed countries. But after that and especially after 1950 when a large number of countries of Asia, Africa, Latin America became free from colonial clutches, they started focusing on development programs and health programs and in these countries in 5 year, 10 years time irrespective of per capita income, religion, language everything mortality started declining at a very fast rate, birth rate remains same.

So, there was a period of rapid population growth and that were the time 1950's 60's that economist, sociologist and other social scientists, they started talking about population explosion. Now, this American demographer Warren Thompson and W Notestein they developed an elaborate theory of demographic transition.

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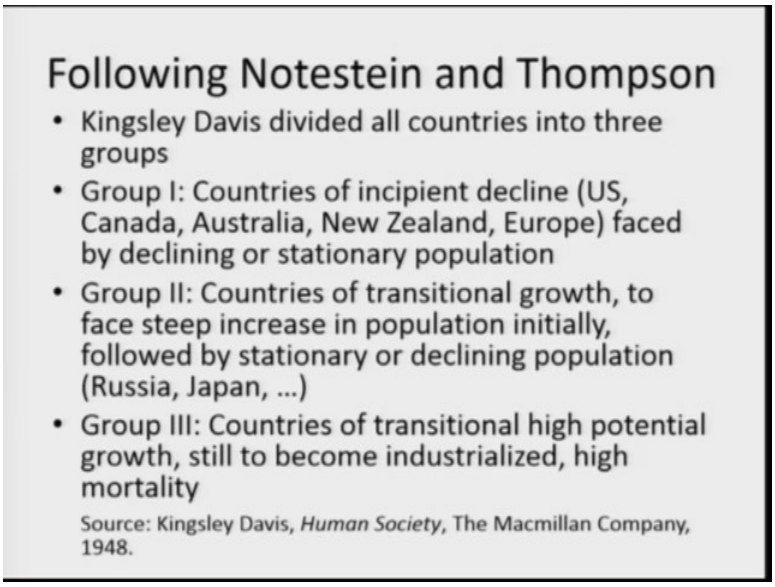

According to Notestein and Thompson, Kingsley Davis divided all countries into three groups. Group I countries of incipient decline; countries of transitional growth; group III countries of transitional; high potential growth is still to become industrialized that. This is taken from 1948 publication of Kingsley Davis and Kingsley Davis is referring to Notestein and Thompson's theory.

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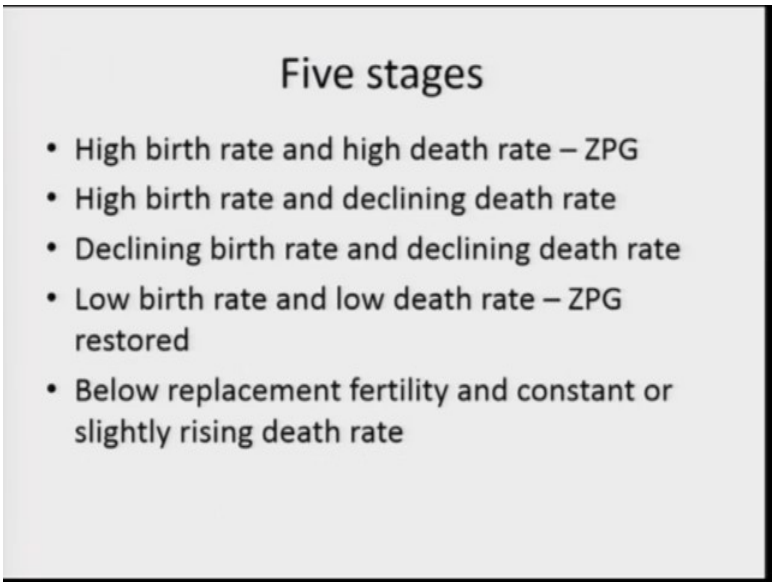

They talk of five stages. One can talk of three stages. First stage when birth rate and death rate are high; second stage when death rates started declining and third stage when birth rate has also declined or one can talk of five stages. Here Notestein five stage theory is given. First stage high birth rate, high death rate; population growth rate is 0. High birth rate and declining death rate. Third, declining birth rate and declining death rate. Fourth, low birth rate and low death rate; 0 population growth again restored and lastly, fifth stage below replacement fertility and constant or slightly rising death rate.

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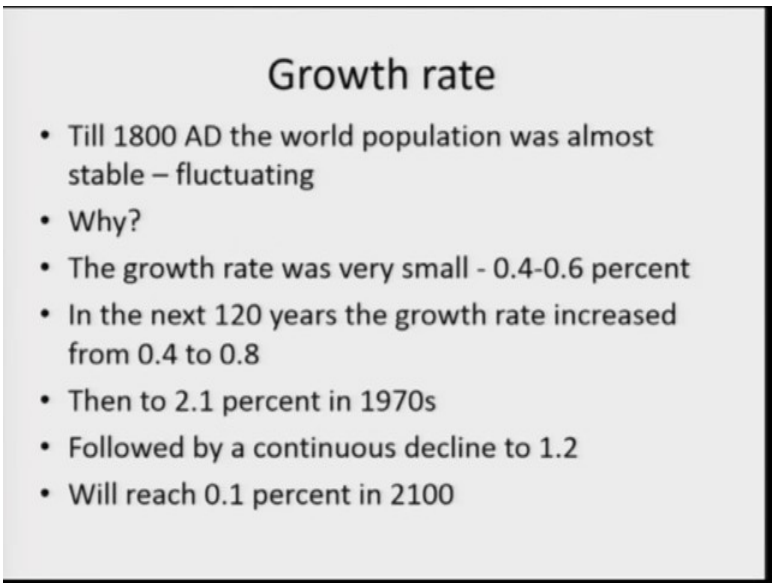

Now, growth rate obviously, in the first stage growth rate is 0 and in fourth stage again growth rate is 0 and then, what will happen may be some countries will experience positive growth rate, some countries will experience negative growth rate depends. These figures are indicative of growth rates in different decades.

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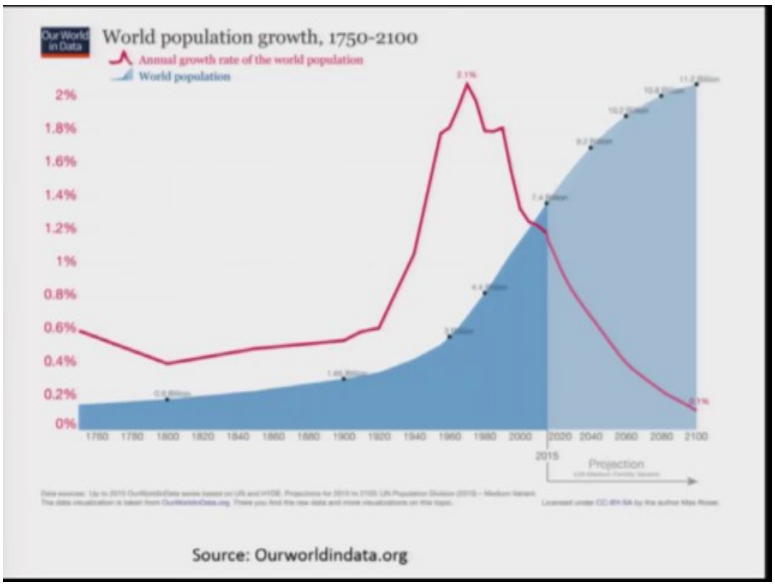

This picture shows the world population growth. This is the growth rate in 1760, growth rate was very less around 0.6 percent. It declined, we observed a similar decline in India's population between 1911 and 1921, then the world population rises. The rate of growth of world population reaches a peak of 2.1 percent around 1970 and after that world population growth rate has been declining, although the size of world population is constantly increasing.

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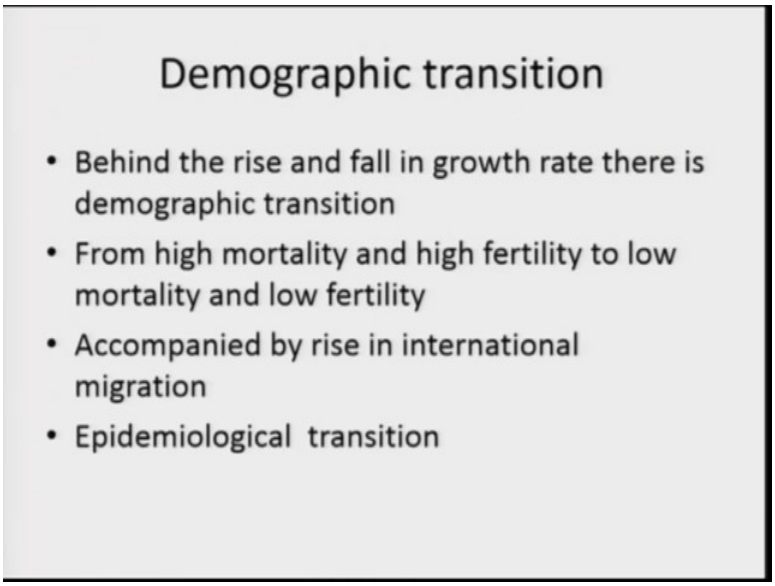

So, growth rate today, we are in a situation in which growth rate is declining, but size of world population is increasing; this is demographic transition.

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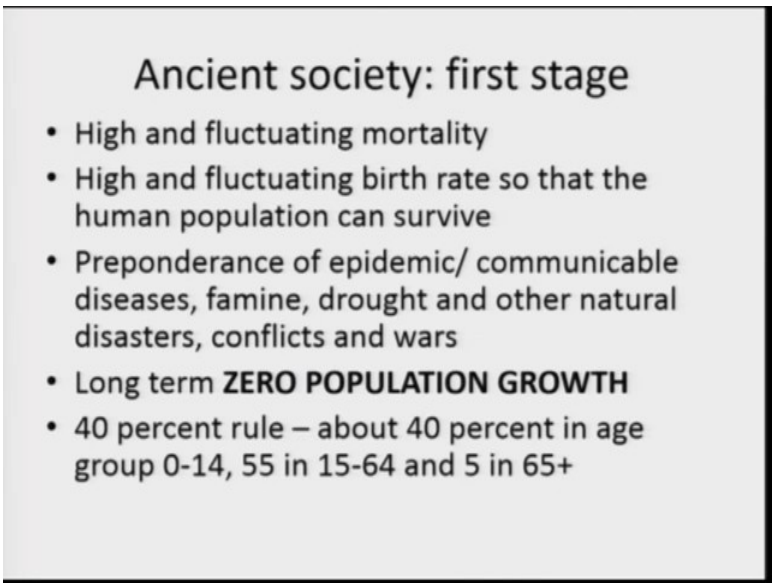

Ancient society or first stage; high in fluctuating mortality and birth rate, as I have already explained.

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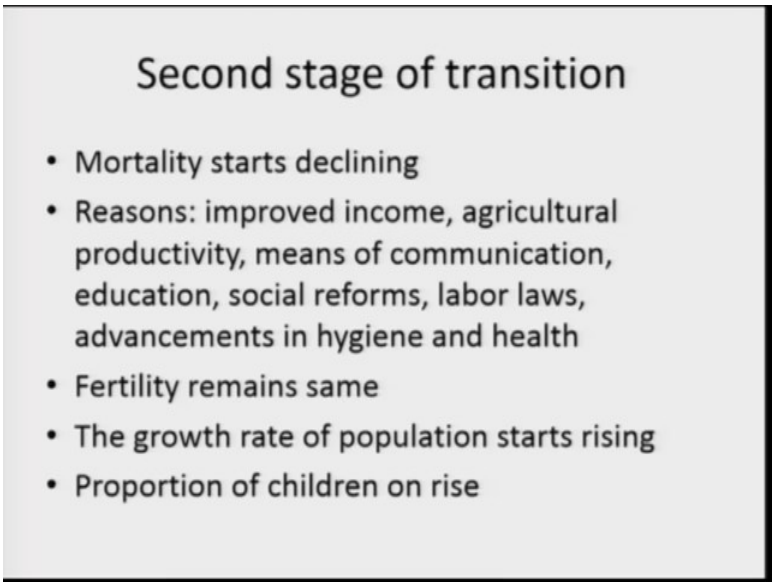

Second stage mortality start declining; fertility remains same.

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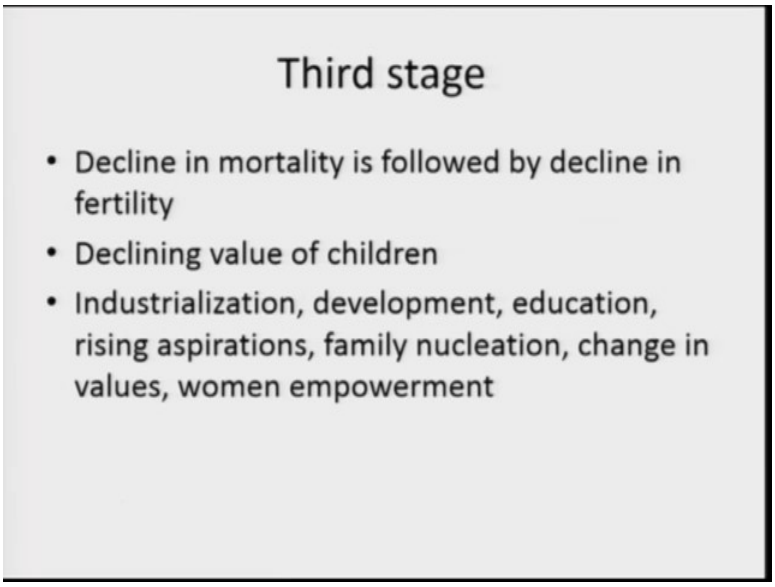

Third stage mortality is followed by decline in fertility and that is because of declining value of children and then, industrialization, development, education, rising aspirations, family nucleation, joint to nuclear family, change in values, value of children, value of materialism, success and women empowerment; these are the factors which lead to fertility decline.

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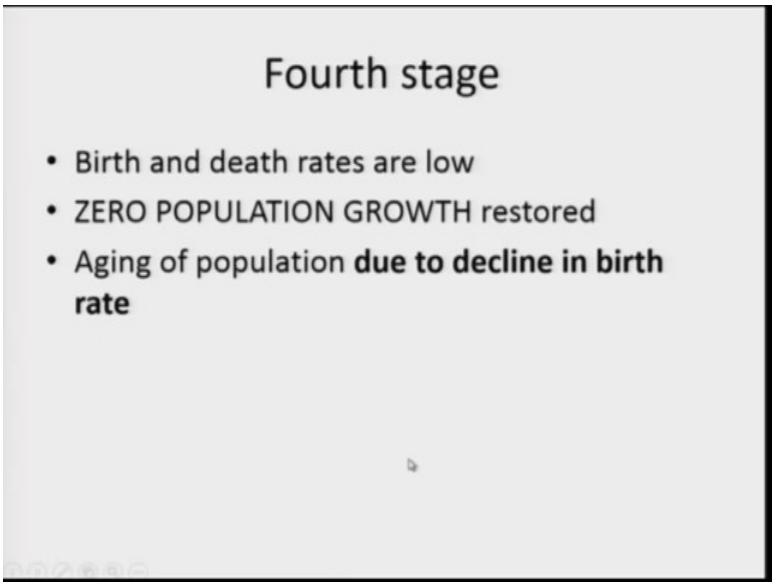

Fourth stage birth and death rates are low; population growth 0. And now there is a new problem due to decline in fertility and improvement in life expectancy, there is aging of population. Median age of world population starts rising.

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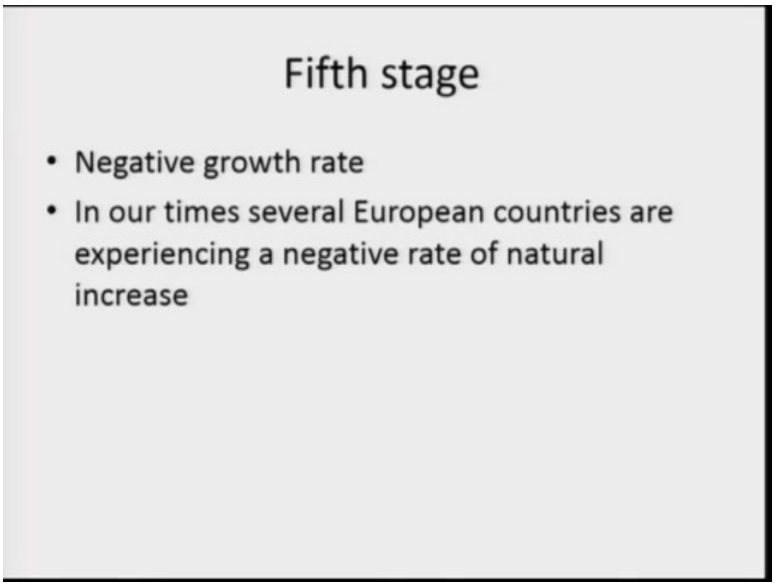

And finally, in the fifth stage as asserted by Notestein and Thompson and there is a negative growth rate and in our time several European countries are indeed experiencing a negative growth rate of population.

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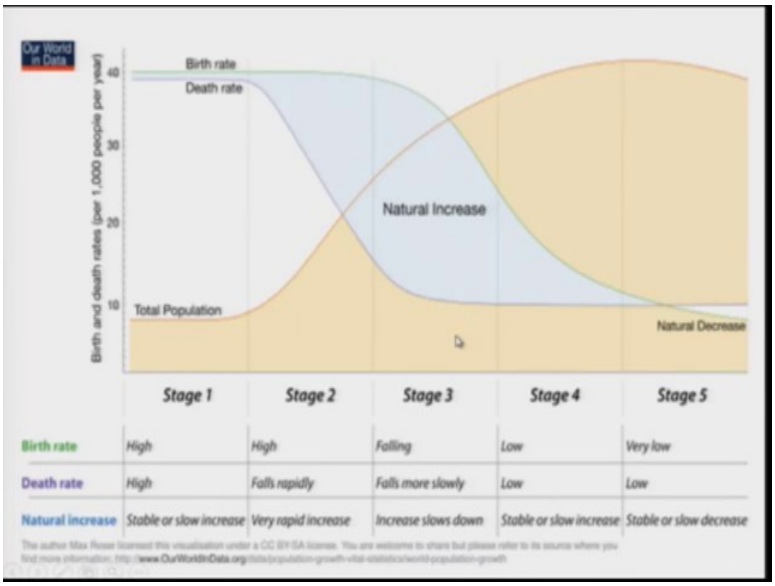

This is what is stage is mean. Stage 1 2 3 4 5 world population is rising birth rate, death rates start declining first; birth rate decline follows, in between there is a time stage 3, there is a time when the difference between birth rate and death rate is largest and that is the time of population explosion.

Now, the death rate, it may be pointed out that to reduce death rate its easier. People welcome strategies, approaches leading to improvement in life expectancy, health, quality of life, but decrease in birth rate depends on the decision regarding fertility taken by a large number of individual couples. If the individual couples due to religious reasons, traditional reasons influence of parents or socioeconomic reasons or some other motivations want to have large family.

Then, government has a limit to which it can motivate them to reduce fertility. So, decline in mortality or improvement in mortality takes this course, mortality decline happens first and fertility decline takes time and so, the population increases during this period of transition.

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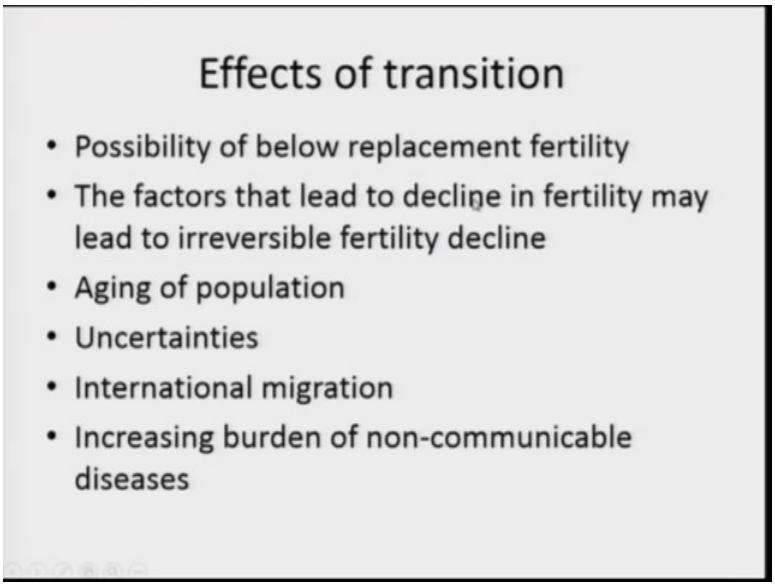

Effects of transition. Now, there is today we live in a world in which there is a possibility of fertility going below the replacement level. As in several European countries this has happened and this the factors because of which fertility has declined, mainly empowerment of women. A famous demographer Nathan Keyfitz even makes a hypothesis that there is a negative correlation between women empowerment and societies power to survive.

Those societies and those communities within societies which control their women have higher fertility and their survival chances are there for more and those societies and those communities within societies which give more freedom to their women they start facing declining fertility. And maybe eventually below replacement fertility of less than 2.1 children and this transition also leads to aging of population various types of uncertainties, international migration and increasing burden of non-communicable diseases; diseases of lifestyle and diseases of old age.

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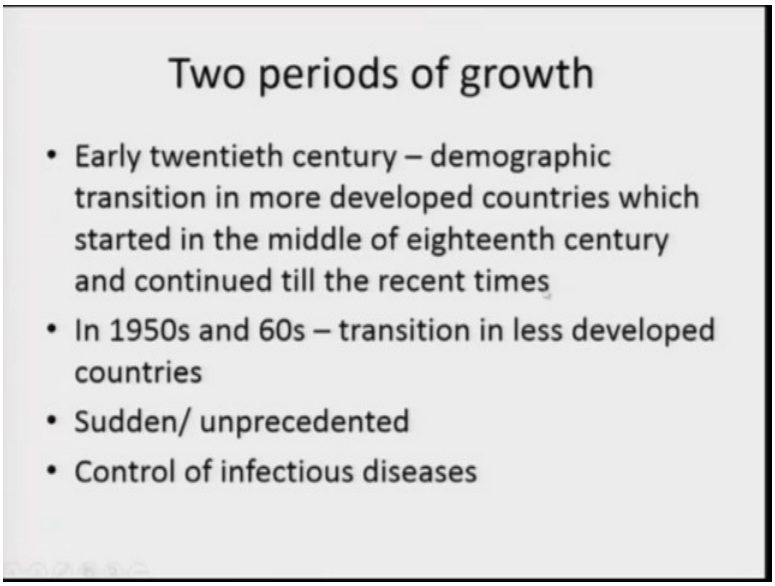

So, there are two periods of growth in developed countries; growth started in 19th century, much of 19th century. In less developed countries in 50's and 60's.

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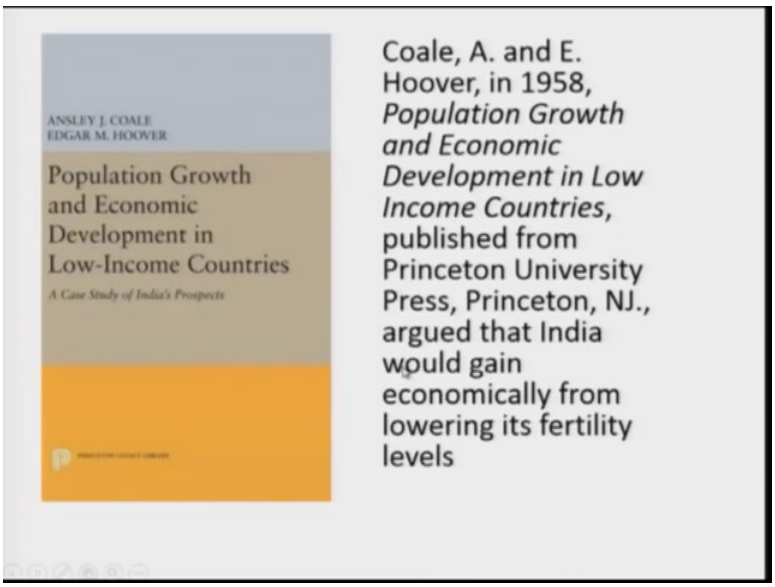

Impact of population growth on development. First school say that there is an adverse impact, why? The champion of this school of thought which may be called a kind of Malthusian thought, but Malthus; Malthus theory was only a speculative theory Coale and Hoover make their claim that in the long run expand expenditure on fertility decline

would be beneficial for development. Because in the long term fertility decline will help the development; the claim was made in 50's.

So, this 1958 book of Coale and Hoover Population Growth and Economic Development in Low-Income Countries modeled the relationship between population growth and development and focused on India, then the generalization was made to all low income countries.

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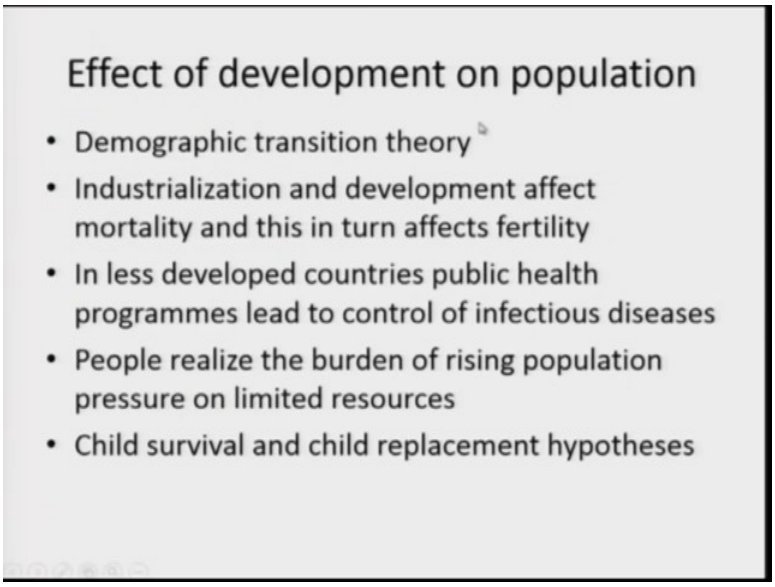

Effect of development on Coale and Hoover did two interesting things; first they studied the impact of development on population and then, the impact of population on development. Now, development of affects population throw reduction in mortality improvement in health and that is followed by fertility decline and development also leads to reduction in fertility subsequently.

So, development on the one hand development affects population and on the other hand, population also effects development. When we talk of population on development then we are talking of several things; population size, population growth rate and age and sex composition of population. Coale and Hoover explicitly considered the impact of size, growth rate and age and sex composition of population on development.

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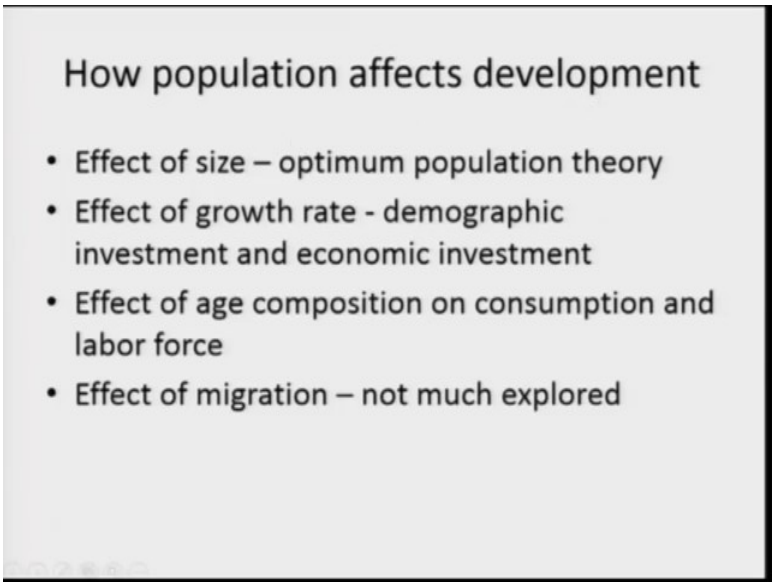

Population affect development.

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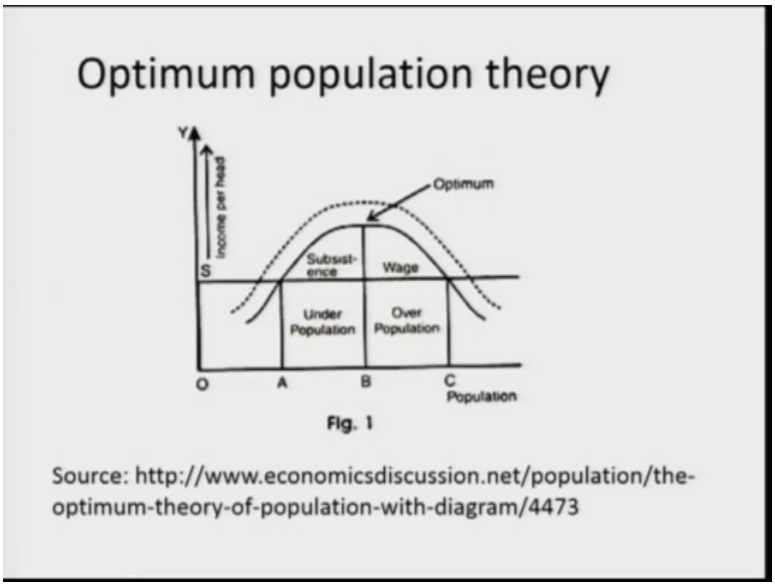

And in one of the previous lectures I talked about optimum population theory. This is Coale and Hoover also give example of optimum population theory that initially when population rises, it is good for development; but after reaching a certain level ah, they call optimum. After reaching this optimum level, further growth of population will not be good for economic development.

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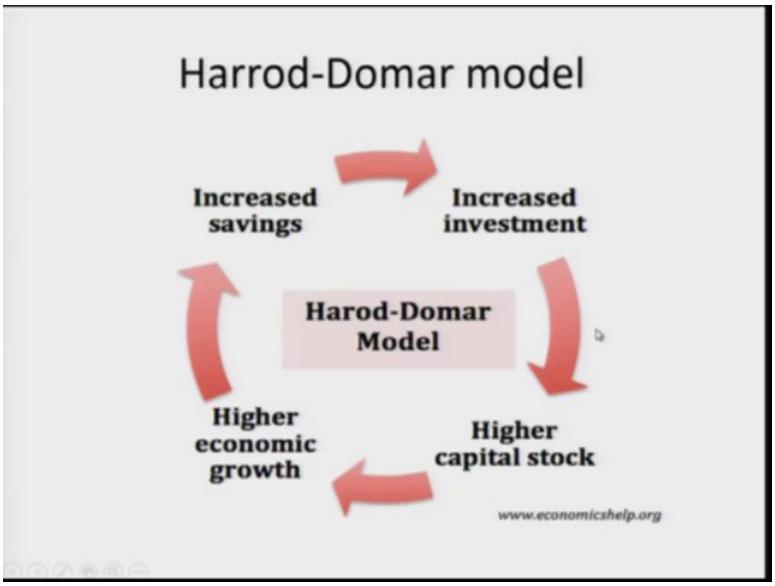

According to Coale and Hoover, the measure they used a Harrod Domar model of economics and actually our development depends on investment and investment depends on savings mobilization of saving. Now, how does population growth affect all this. If population if there are increased savings, then it means increased investment; then higher capital stock and then higher economic growth.

And there is a virtuous circle of increased saving, increase investment, higher capital stock and higher economic growth. But if population growth is high, first you need to spend a lot of money on satisfying the existing, satisfying the needs of the existing population and the population is growing fast then obviously, the expenditure required to meet the needs of the growing population will be more.

Second whatever is the saving; from savings some amount has to be invested in human capital, in building human capital in schools in health and so, the money that is left out for investment for productive purposes is further reduced and this is the reason why growth of population leads to reduction in investment and when investment is reduced, capital stock is reduced, economic growth is reduced, savings are reduced and it becomes a negative circle.

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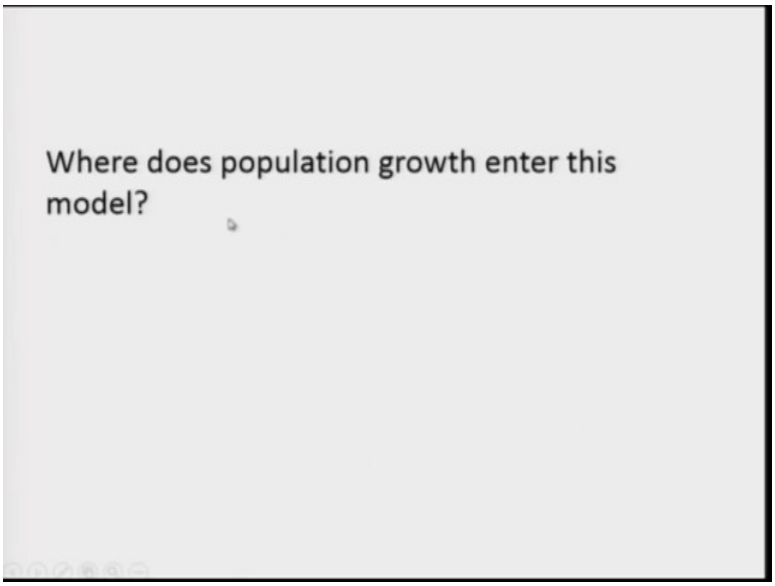

Means now, where does population growth enter in this?

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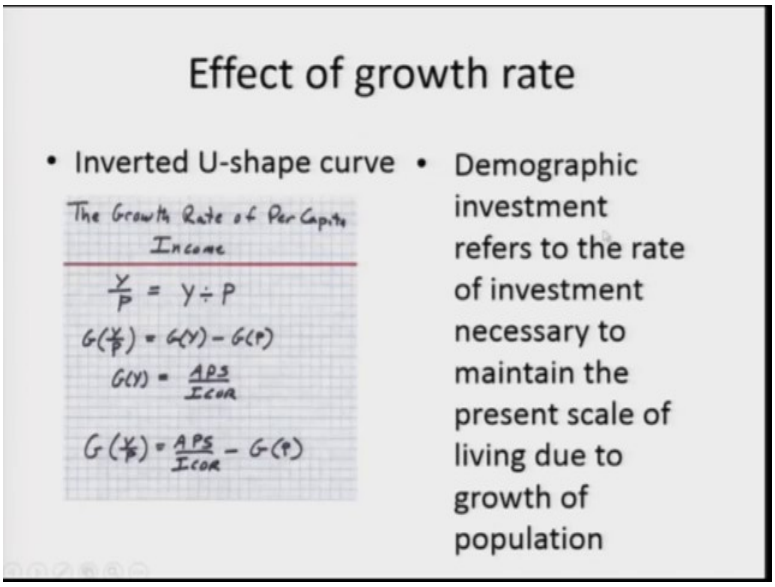

I said that demographic investment when population grows rate as fast rate, then you spend more on satisfying the needs of the food needs, housing needs, infrastructure; all kinds of needs of the existing population. So, demography and therefore, the money that is left out for investment is reduced.

So, you can think of two types of investment; demographic investment. Demographic investment is that amount if you invest that amount in the economy, if you invest that in

the economy then income grows, but since population also grows. So, the net result is that per capita income remains same. You remain where you are and perhaps that was the reason why for 3 or 4 decades, India after Independence grew at what is called Hindu rate of growth of nearly 1 percent per year. We invest, but the benefit of investment is eaten away by the growth of population and this is demography.

If population growth rate is high, then demographic investment is more and economic investment which will lead to development of the country or improvement in per capita standards will be less.

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A high growth rate of population reduces economic investment because of these reasons. These reasons are derived from the study of Coale and Hoover.

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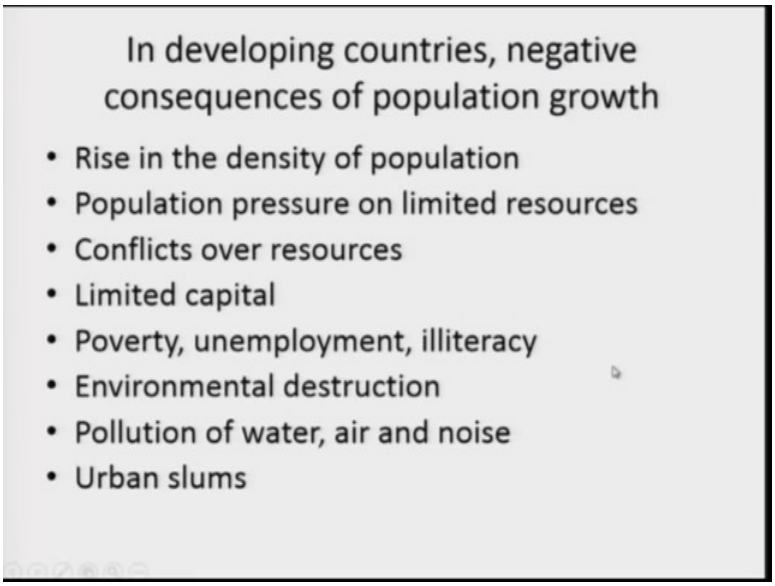

In developing countries, negative consequences of population growth are rise in the density of population; population pressure on limited resources; conflicts over resources; limited capital; poverty, unemployment, illiteracy; environmental destruction due to poverty; environmental is being destroyed not only by industry, but environment is also destroyed by poverty.

Actually in international meets when developing countries start talking of controlling industrialization or level charge of producing more carbon emission in developed countries, they also say that in less developed countries the main cause of environmental destruction pollution is poverty and this leads to pollution of water, air and noise.

So, what this lecture shows that initially as I mentioned in one slide population of the world grew very very slowly. Actually, these marks are very important in 1820 AD for the first time world population reached 1 billion mark and then, in 1930 it took 110 year to add to another billion. But the third billion was added only in 30 years' time and then, population started growing. Today, we are 7.7.

Now, behind this there is a demographic transition theory and according to this theory, population grows because of decline of mortality in absence of decline in fertility and this started happening in the developed countries around 300 years ago, but demographic transition took a very long time because it was not created by government policies, it was created by a large number of factors mainly economic development and industrialization

and when fertility started falling perhaps again due to similar factors; industrialization, urbanization and economic development, rise in awareness and social mobility aspirations and so on. Then, fertility also declined on its own and world population started growing slowly.

Around 1950's after Independence of less developed countries due to government intervention, technology to reduce mortality was already available in the developed countries. What less developed countries required was money and money came from United Nations; money came from bilateral relationships; money came from internal mobilization of resources and DDT spray control of infectious diseases and other factors, to some extent improvement in nutrition all these factors led to improvement in life expectancy. But fertility remains same and so, there was a big gap because mortality rate declined in less developed countries suddenly. So, around 1950's and 60's, there was a population explosion.

Now, this population explosion was not seen to be good for less developed countries as shown by and that was the time when economists started talking about Malthus who said that there is a negative relationship between population and development. He said this in ninth in 1798 and his theory was revived. But Coale and Hoover by using Harrod Domar model, economic modeling through mathematical equations and simulation simple simulation, they could show that yes if India spends money on fertility control program, it will gain that improvement in per capita income will be higher under the condition of low fertility.

So, then there are other disadvantages of population growth which I have tried to outline in this presentation and the next presentation, I would give a counter view according to which population growth is not so important and it is the socio-economic institutions which are the major determinants of development.

Thank you.