Conservation Economics
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Module 10
Labour market economics and Conservation
Lecture 1
Markets for factors of production

Namaste! Today, we begin a new module which is Labour Market Economics and Conservation. This module will have 3 lectures; markets for the factors of production, earnings and discrimination, and income inequality and poverty. So, let us begin with the markets for the factors of production.

Now, we are studying topics such as the market for the factors of production or poverty or inequality because they have a very large building with conservation. And in this context, it is important to remember this chart; poverty is closely related to environmental degradation.

This is because if there is poverty in a society, it would mean less per capita resources which in a number of cases would also translate into overpopulation. Now, what we are saying here is that in the case of poverty people have less amount of resources that are available with them; they do not have sufficient money, they do not have sufficient other resources. Now, if the resources are less in a society, then that might result in overpopulation. Now, this might appear a bit too far based, but in a number of societies what we have been observing is that the human populations go through a demographic transition.

What is a demographic transition? In the case of primitive societies or poor societies in today's time, what we observe is that a child when he or she is born, does not have a very good chance of living till adulthood. Why? Because parents are poor. So, the child in a number of cases is malnourished; he or she does not get a sufficient amount of food. Now, because of malnourishment, the child easily falls sick. Now, if the child falls sick, either he or she does not get to see a doctor, because in this society, the per capita resources are so less that the society does not have hospitals, it does not have doctors. Because hospitals and doctors, again they require money to be there in the first place, they are also resources.

When we talk about a dearth of resources, we are not just talking about a dearth of money, but we are also talking about a dearth of these resources; resources such as resources for education, resources for health and so on. So, the child who has fallen sick, does not get to see a doctor and in a very few situations where he or she does get to see the doctor and the doctor prescribes medicines, then probably the parents are unable to pay for it. Now, when you have a situation, where children regularly fall ill because of malnourishment and they regularly are denied hospital care because the hospitals they just do not exist or when they exist, then they are a bit too

pricey for their parents because of which they become unaffordable; what will happen? In a number of situations children will die.
If children die and they die in large numbers, they have a very less life expectancy; in that situation, if the society has to continue, then it will have to compensate at some point. Because if say most of the children have a life expectancy of say 10 to 12 years, in that case the next generation will not have sufficient number of human beings and ultimately, the size of the population will go on decreasing with time. So, to compensate for a very high death rate, societies tend to have a higher birth rate. That is, if each parent finds out that on an average 4 out of 5 children die that would mean that if the parents have 10 children and 8 die, at least 2 will remain. If the parents have 15 children and 12 die, at least 3 will remain.
So, having more children is an insurance that at least a few of the children will reach adulthood. Now, when we have a situation like that, then there is also a good chance of overpopulation, when the society moves towards the phase-II of the demographic transition. Now, what is phase-II of demographic transition? Earlier, we have we begin with a very high birth rate and a high death rate, but then slowly and steadily when the population does get some resources, when it does get the benefits of medical advancements and we are not talking about hi-fi medicines or hi-fi operation theaters; we are talking about things such as clean water, things such as sufficient amount of food.
Once the society starts to get a sufficient amount of food which reduces malnutrition and these diseases or once the society starts to get clean water or a bit of sanitation or even things like soap, then that would drastically bring down the level of infections that we see in the society. Because of that, the death rate would go down. Now, the society that was earlier having a very high birth rate and a very high death rate, now is having a situation where the death rate is going down; but the birth rate does not go down as fast. So, in such a society, you will have a very high birth rate because it started with a high birth rate and we are now having a reducing death rate. So, a high birth rate and a reducing level of death rate would mean that, in total there will be a net growth of population which might even give rise to an overpopulation.
Because these days, we have at least some level of medical advancement, we have at least some facilities that we as a society provide to most of our people. So, government programs ensure that people have access to clean water, and people have access to sanitation. So, in that case, the death rate goes down and there is a chance that there will be more population growth. Now, of course, every society has to go through these transitions or most of the societies go through such transitions; but then what happens is in the third phase, the birth rate starts to go down because now people do have no longer a need to have more and more number of children because they are now more assured that a number of their children will be able to reach to the adulthood.
So, even having 1 or 2 children is good enough and once we have a situation of a reduced birth rate as well, then the population becomes stabilized. But in the intervening period, there is a chance that the population will rise and which is what we are observing here, less per capita resources could lead to overpopulation. There is also another thing that might occur in certain situations. When the per capita resources are less, then in a number of situations people want to have more children, also because these children will provide hands to work in the fields. So, to in-

crease the resources of a family, it is prudent. And remember, that in economics, we always begin with the assumption that people do rational thinking. So, rationally, if they have more children, that would mean that at least their fields will get plowed and at least their fields will be sown with crops, the crops will be taken care of.

It is prudent for the families, just because of a rational thinking to have more children, when they are more poor which is what we are observing here. So, less per capita resources could lead to overpopulation. Now, in the case of overpopulation, there is an extra stress on the land. Why? Because more children does not just mean more hands towards the field, it also means more mouths to feed. So, when you have a society where more children are being born, a society which has a large population, in that case there are a number of mouths to feed, there are a number of bodies to clothe, which means that the level of resources that is required in total will increase.

Now, here still we are having low per capita resources, but the total number of resources that is needed is given by total resources needed is equal to per capita resources. So, this is resources per unit population multiplied by the population size. In this case even though the per capita resource requirement is less, but because the population size is more, which means that the total resources limited are very high. Now, where will these resources come from? Where will we get sufficient food for all these people? Now, remember here that when we are saying sufficient food, it is not sufficient food when we talk about a biological sense.

So, people are not getting sufficient food, they are still malnourished; but they at least need that amount of food that can remove their hunger. So, when we talk about just feeding the people that in total would require a very large amount of food because the population size is large and how are people going to get that large amount of food? Well, by taking out resources from land. So, in that case a number of forests will be cut and they will be converted into farmlands, which is what we are observing here; land and environmental degradation. So, there is a great stress on land and this will lead to land and environmental degradation. Now, this is even more so because there are less resources that are available with people in this society.

If the resources were more, then probably the same amount of agricultural land would have given a higher amount of crops through the application of fertilizers of pesticides or modern machinery. But because the per capita resources are less, it would also mean that the stress becomes even more, because of a less amount of productivity. So, this leads to the land and environmental degradation, where more and more forests are destroyed and they get converted into farmlands and these farmlands are just working on a subsistence level, which means that even when people work on large sized farmlands, they do not still get sufficient output from the land because the productivity is less.

And also, because in a number of cases the forests are there in those lands that were not that much fertile because if the lands were fertile, then people would have actually converted them into farmlands way back. Only the best lands are preferentially converted into agriculture. So, the forests that still remain are there on those lands that are not good enough for agriculture. Even though there is an expansion of agriculture and there is a huge amount of land and environmental degradation, there will be a further loss of productivity. Because these expansions are being made in those areas that are even more infertile and when we have a loss of productivity that would further accentuate the poverty.

So, this cycle becomes a vicious cycle and it goes on and on and it is important to remember here that poverty is also a part of this cycle and land and environmental degradation are also a part of this cycle. So, poverty is closely, intimately related to environmental degradation, which is why it is important for us as conservation economists to know what causes poverty and how we can solve poverty.

So, to understand poverty, we need to understand the labour market economics. What is labour market economics? What is the labour market? If you will remember, we had talked about the circular flow diagram. Now, the circular flow diagram is a model of the economy in which we have firms and firms are those parts of the economy that produce and sell goods and services and hire and use the factors of production. A good example is an industry that is making things such as a pen. Now, this industry is producing a good and to produce the good, it is hiring labour, it is making use of other factors of production such as land and capital and by using these factors of production, it is churning out pens and it is selling them out in the market. So, that is a firm.

The other component is households, who buy and consume the goods and services, that is the households will purchase this pen and they own and sell the factors of production such as land labour or capital. So, the people who comprise the household, they have their labour to sell and they sell their labour to the firms and so, we have two kinds of markets. We have the market for goods and services that you are very much aware of because in the good market for goods and services, the goods and services are sold by the firms and bought by the households. So, if you go to the market and purchase a pen, then that is a market for the goods and services.

In this market, there is a firm that is selling you the pen, you are purchasing the pen and so, you are paying the firm with money. In this case, the household spends; they are doing their spending and this spending becomes a revenue for the firms. But there is also another market which is the market for the factors of production. In this market, the households sell the land, labour and capital, which means that people in the households will offer their labour. They will offer to work to save wages or they will offer their land on rent or they will offer their capital which is with them, that is the money that is with them for a share of the profit. When a household invests in say a company's shares, then it is investing in this market. Because it is giving the company its money in the form of its capital, in return for a profit from the shares.

In this market, the land, labour and capital are sold by the households and they become the factors of production for the firm and in return, the firms pay wages, rent or profit which becomes the income of the households. Now, in this module, we are concentrating ourselves with this market, the market for the factors of production and we are asking the question that if there is a household and this household is a poor household, what are the factors that determine how much money this household will get in this market. Because this is the market in which the household is earning. So, what determines, what will be the level of wages that is received by this household? What will determine the level of profits that they receive? What will determine the rent that they receive, if they give the firm their land to establish a factory?

That is the question that we are asking because that has got a lot to do with the level of poverty that is there in this household. So, if the wage rates go up, if people start to earn more, in that case the per capita availability of resources will increase for the household and when that happens, it is possible that the household will no longer remain poor and if the household is no longer poor, then the pressure that they are putting on the land and environment that will go down, which will have important ramifications for things like conservation. We will have less of our forest that will be deforested to convert into farmlands and we will have less number of people who would be willing to go into a forest to cut trees. So, this has very important ramifications. What governs the wages, rent and profit in this particular market?

We begin by defining a few terms. The factors of production; the factors of production are the inputs that are used to produce goods and service; "inputs used to produce goods and services". Now, what are these inputs? These inputs include things like land, labour and capital and when we talk about this market, we are talking about the demand and supply for land, labour and capital, that will determine the prices that are paid to the land owners, workers and the capital owners.

What we are saying here is that just like in the market for goods and services, here as well we have a demand and we have a supply and this demand and supply will determine at its equilibrium, what is the equilibrium price and what is the equilibrium quantity and we are interested in knowing the equilibrium price and the equilibrium quantity. Capital is defined as the equipment and structures used to produce the goods and services. It is equipment such as tools and structures such as a building. If there is a factory that is residing in a building, so this building is the structure and the equipment or the tools that they are using all of these are known as capital. So, capital is the equipment and structures used to produce the goods and services.

And in the market for labour or in the market for the factors of production, what we are saying is that there will be a demand, there will be a supply. And on the Y-axis, here in place of the prices, we have the wages because the price that is paid to the workers is the wages that they get. So, that is there on the Y-axis and on the X-axis, we have the quantity of workers which is telling us the level of employment that we will have or how easy it will be for a person to get a job in this market. So, these two things the demand and supply in the labour market will determine the wages that people get and whether they get the wages at all or not; that is whether or not they will get some sort of an employment through this market or not.

To understand how demand and supply are regulated in the labour market, let us take the example of a firm that is a labour intensive firm, such as a firm that is making samosas. Now, for our study, we will take the firm to be a competitive profit maximizing firm. Now, when we say that the firm is competitive, it means that it is a price taker. So, it does not have a huge amount of market power and the price that has been determined by the market for the product that it is making, that is the samosa is fixed. Let us say that 1 samosa can be sold for 5 rupees in the market. So, competitive means that this firm is a price taker and it is a profit maximizing firm, which means that the decisions in this firm are taken on the basis of rational decision-making processes, that is the firm tries to maximize the profit that it has.

In this chart, the first column we have the number of workers. The firm can have 0 workers, it can have 1, 2, 3, 4, 5, 6 or any number of workers. Now, because the production of samosas requires labour; so, if you have a firm with 0 labourers, then probably the amount of output will also be 0. So, in that case, we are just taking this value of 0 as a theoretical construct, it is not a practical construct because you will not find a samosa making firm that is not employing anybody. So, if the number of labourers is 1, then the output or the number of samosas that are being made in this firm per hour is say 50. Now, when the firm hires more labourers, then the output will increase. But it will not increase in a regular fashion as in it will not double, when you are doubling the labour that is there being employed.

Now, why is that so? Because there are a number of considerations. Labour is not the only factor of production. You also require things like land and capital and perhaps, they will start to show their limitations in a very short period of time. If there is a firm that has a kitchen and this is not a very big sized kitchen. If there is 1 labourer, he is making 50 samosas. If there are 2 labourers then it is possible that there will be a small shortage of space, that is the 2 might start to bump into each other or they may start to chit chat because you have 2 people, so they will naturally start to have some conversation.

When they are having a conversation, then that is a time or that is an effort that is being removed from the process of samosa making and diverted into conversation or it is possible that now the labourers, they are not getting everything right there on the spot and one labourer starts to make the samosa and the second one starts to move things around. So, it is possible that the efficiency may go down, which is what we are observing here. So, with 1 labourer the firm was putting an output of 50 samosas per hour; with 2 labourers it is putting an output of 90 samosas per hour; it is not putting an output of 100. With 3 labourers, the output has increased further; but it has only increased to 120. With 4 labourers, it has increased to 140.

What we are observing here is that the increase is going on, but it is becoming less and less with time or with more and more labourers. Why? Because when you have just 2 labourers, then probably the space is not that big of a shortage than if you have say 5 labourers. So, when you increase from 1 to 2, the space is not a shortage; but when you increase from 5 to 6, probably it has become a bit too overcrowded. So, in such a scenario, the labourers are not able to have sufficient space to make the samosas, which is what we are observing here. And from this, we can compute the marginal product of the labour. Marginal product is the change in the quantity divided by the change in the number of workers. So, when you move from 0 to 1 labourer, there is an increase of 50. So, delta Q in this case is 50, which is 50 minus 0; delta L is 1 minus 0, which is 1.

In this case, the marginal product of labour, MPL is delta Q by delta L which is 50 minus 0 divided by 1 minus 0 is 50 by 1 is 50. When the number of labourers increases from 1 to 2, then the output increases from 50 to 90. So, in that case the MPL is delta Q by delta L is 90 minus 50 divided by 2 minus 1. Because earlier the Q was 90 and now the ah, earlier the Q was 50 and now it is 90. So, delta Q is 90 minus 50 which is 40 delta L is 2 minus 1 is 1. So, this is 40, which is what we are observing here. So, the marginal product of labour in this case is 40.

When the number of labour is increased from 2 to 3, then delta Q in this case is 120 minus 90 is 30. Delta L because we are increasing 1 labour at every point of time, so delta L is 1 in each case. So, essentially for this labourer, the third labourer, the marginal product is 20 is 120 minus

90 which is 30 divided by 1 is 30. For the fourth one, it is 140 minus 120 which is 20 divided by 1 is 20. For the fifth one, it is 150 minus 140 which is 10 divided by 1 is 10. For the sixth one, it reduces even further.

What we are observing here is that the marginal product of labour is going down or in essence, what we are seeing is that when the number of workers is increased, the output per hour increases; but it goes on becoming flatter with more and more workers. This is known as the production function. The output versus the number of workers is the production function. We are observing that the output is increasing, but the rate of increase is decreasing. It is increasing; but earlier the increase is very high when you add 1 labour, but later on it becomes lesser and lesser.

The marginal product of labour is the increase in the output in the amount of output from an additional unit of labour; increase in output from additional unit of labour. So, you are adding 1 more labour, what is the increase in the output which is what we calculated here. Now, here we can talk about the law of diminishing marginal product. What does that mean? It is the property whereby, the marginal product of an input declines as the quantity of the input increases, which is what we are observing here.

As the number of labourers increase, the marginal product goes on decreasing. This is the Law of diminishing marginal product. Diminishing means reducing, so it is the law of reducing marginal product with more and more labour, the marginal product of labour goes on decreasing and the reasons include things like crowding, insufficient access to equipment, chit chats and so on. So, probably there is only 1 mixer or probably there is only 1 stove or let us say that there are only 2 stoves and if you have 6 labourers, then not everybody is having an access to the stove at all times. So, you can have the diminishing marginal product because of crowding, physical crowding or insufficient access to equipment or because of chit chats and so on.

If we plot the marginal product, we observe that in the first case, the marginal product was 50, then 40, then 30, then 20. So, it is decreasing with an increase in the number of workers. So, this is showing us the Law of diminishing marginal product.

Next, we can define the value of the marginal product, which is the marginal product of an input times the price of the output. Now, in this case, the firm is interested in maximizing its profit. So, what the firm does is is that it is doing a calculation of what is the amount of output that I am going to get with each labour and what is the market value of that output, that is if an additional labour is going to produce say 30 samosas and 1 samosa is will will be sold for 5 rupees. So, the value of the marginal product of the labour is 30 samosas into 5 rupees per samosa is 150 rupees. So, that is the value of the marginal product. The marginal product of an input times the price of the output, which is what we are showing here.

The value of the marginal product of labour is 50 into 5. Now, here we are taking that 1 samosa is 5 rupees because this is a competitive fund. So, it is not able to change the market prices and at the same time there are so many buyers that if it is producing more samosas that is not changing the price of the samosa. So, whether it sells 1 samosa or whether it sells 1000 or 10000, they will be sold for 5 rupees a piece. Now, this again is a theoretical construct, we do not observe such scenarios in the market.

But for the sake of simplicity, we are assuming that the price remains constant. So, the value of the marginal product of labour is shown in this column. So, if the marginal product of labour is 50, then 50 into 5 is 250. If MPL is 40, then 40 into the price; 40 into 5 is 200; 30 into 5 is 150; 20 into 5 is 100; 10 into 5 is 50 and 5 into 5 is 25. So, this is how we compute the value of the marginal product of labour.

Similar to what we observed in the case of the marginal product, if you plot the value of the marginal product of labour, we will again find a diminishing curve. Now, this is expected because there will be no difference between this curve and this curve; it is just that the first curve, the marginal product, is multiplied by a constant value. In this case, 5 rupees because the firm is a competitive firm and it is a price taker.

Next, we have the wages. Now, we can have the prevailing wage rate and suppose the wage rate is 100 rupees. If we plot 100 rupees as this green line, then the profit maximizing quantity of labour in this case will be given by this point, where both the curves are intersecting each other. Now, why is that so? Well, when the number of workers is increased from 0 to 1, now this first worker is able to produce a good that can be sold for 250 rupees and the wage that has to be given to hire this labour is just 100 rupees.

So, when the number of laborers is increased from 0 to 1, then the additional labour is producing something that has a much greater value of the marginal product than the wage rate, which means that if the company or the firm hires this labour and uses this labour to produce the good; then the company is adding to its profit and we began by saying that this is a profit maximizing firm. Now, when the number of workers increases from 1 to 2, then the second worker that the company hires will produce a good that is worth 200 rupees, more than what the first labour was producing. So, the first labour was producing goods of 250 rupees, the second labour was producing goods of 200 rupees, so totally the goods that are being produced are now 450 rupees worth. But to make this extra good of 200 rupees, the company has to pay 100 rupees. So, this difference is the profit of the company or of the firm.

For the first worker, the profit to the firm is this much; for the second firm, the profit to the firm is this much. For the third worker, he makes goods worth 150 rupees and the company has to pay 100 rupees. So, the profit to the firm is only this much. In the case of the fourth worker, the value of the goods is 100 rupees; but to make those goods, the firm will have to pay 100 rupees of wages to the worker. So, now the company would be in a dilemma because whether it hires this worker or not, there is no change in the profit. But if the company or the firm hires 1 more labourer, then the value of the goods is 50 rupees; but the firm has to pay 100 rupees. So, this is the level of loss to the firm. So, at this point, the firm was at a profit; at this point, the firm is at a loss. So, this becomes the profit maximizing quantity and at this point, the firm may or may not hire the labour.

We can also look at the marginal profit in each case. What is the marginal profit? It is defined as the value of the marginal product of labour minus the wage rate; the prevailing wage rate. So, if we did this computation for the first labour, the value is 250 rupees, the wage is 100 rupees. So, the marginal profit is 150 rupees. That is, if the company hires this labour, then by hiring 1 unit of labour, the company will increase its marginal profit or will increase its profit by 150 rupees. So, that is the marginal profit. For the second labour, the value is 200 rupees, the wage is 100 rupees. So, you can think of it as the value of the product that you are buying from the market and the cost that you have to pay.

In this case the value of the marginal product of labour is the value to the company and we had seen even in the case of the market for goods and services, if I am going to the market to purchase a pen and the value of this pen in my eyes is 30 rupees and the cost or the price at which it is available is 20 rupees. Then, I will buy this pen. But if the value in my eyes is 30 rupees and if it is available for 50 rupees, then I will not buy the pen and this is exactly what we are observing here. If the value of the marginal product of labour is greater than the wage, that is if the value is greater than the price that needs to be paid; then, the company will or the firm will buy this good. In this case, it is the labour and the marginal profit for the second labour is 200 minus 100 is 100. For the third labour, he makes goods worth 150 rupees and the company has to incur a cost of 100 rupees. So, in this case, the marginal profit becomes 150 minus 100 is 50. And we are observing that the marginal profit is reducing with each extra labour because of the Law of diminishing marginal product. For the fourth labour if the company hires him, then the value of the of the marginal product of labour is 100 rupees, the wage is 100 rupees which means that the company will earn a marginal profit of 0 rupees, which means that before the company hires this labour and after the company hires this labour, there is no change in the profit. And with an extra unit of labour, now the company is incurring a loss because the value of the marginal product is now less than the wage rate, which means that in the case of our pen example the value of this pen is 30 rupees and it is now available for 50 rupees or say 40 rupees. So, if it is available for anything more than its value, then I am not going to purchase it and similarly, in the case of a firm that is there in the market to purchase labour, if the value of the labour is less and the price of that labour is more. In this case, the value is the value of the marginal product of labour and the price is the prevailing wage rate. So, if the value is greater than the price, the company will buy the labour. If the value is less than the price, then the company will not buy the labour of this person. So, as the number of labourers increases to 6, then you have the situation that the value of the marginal product of labour is 25 rupees and the wage rate is 100. So, the marginal profit is now minus 75 rupees.

This is what we are plotting here. The marginal profit versus the number of workers and the profit maximizing quantity is given by this point, where the marginal profit is 0. So, at all the points to the left of this point, we have that there is a positive marginal profit and a positive marginal profit means that by adding one more unit of the labour, the company will add to its profit. And to the right of this point, we have a negative marginal profit, which means that if the firm adds the labour, then it will reduce its profit and we begin with the assumption that this firm is a profit maximizing firm. So, when the marginal profit becomes negative, then the firm will not hire the labour.

So, the demand for the labour will be determined by the value of the marginal product and the value of the marginal product is the marginal product multiplied by the price of the output. So, in this case, the labour demand will depend on the price of the output.

If the price of the output is more, then the demand will increase. Now, suppose in our example, the P in place of 5, suppose it was 10. If we compute P, P is equal to 10; then, the value of the marginal product of labour in place of 250, it would be 500. Here, it will be 400 because what we are doing is 40 into 10 is 400; 30 into 10 is 300; 200; 100 and 50. So, this is the value of the marginal product of labour.

In the earlier case, we were observing that when the company hires the fourth labour, then the value of the marginal product of labour is equal to the wage rate; but in this case, when the company hires the fourth labour, the value of the marginal product of labour is greater than the wage rate. So, the fourth labour is definitely hired. What about the fifth one? In the case of the fifth labour, the value of the marginal product is equal to the wage rate. So, now, one more labour will be employed by the firm because the price has increased. And because of an increase in price, it reflects in the value of the marginal product of the labour and we have seen that the profit maximizing quantity is where the value of the marginal product of the labour is equal to the wage rate.

If the wage rate remains the same and if the price changes, then this curve, the red curve, will shift upwards which will change the number of labour that will be hired by the firm at the profit maximizing quantity. The labour demand depends on the price of the output; more is the price of the output, more is the demand for the labour and also, on the marginal product. Now, marginal product in turn depends on labour productivity such as including technological changes and it depends on the supply of other factors such as raw materials. Now, what we are observing here is that the marginal product depends on things like labour productivity. Now, in our example if the labour productivity was more, that is the number of samosas per unit per hour, if it increases because the marginal product of labour increases.

What we are saying is that in place of making just 50 samosas, if this labourer was more trained, and suppose he was able to make 70 samosas. Similarly, if this one was able to make say 60 samosas, if the next one was able to make 55 samosas, if the next one was able to make say 50 samosas, if the next one was able to make say 45 samosas; now, in this case if the price remains the same. We are again talking about a price of 5 rupees. Now, what happens to the marginal product of labour and suppose the next one was able to make 40 samosas? Now, in this case the marginal product of labour will be given as for the first one, it is 70 into 5 is 350; for the second one, it is 60 into 5 is 300; for the third one, it is 55 into 5 which is 275; for the next one, it becomes 50 into 5 is 250; for the next one, it becomes 225 and for the next one, it becomes 200.

So, this is the value of the marginal product of labour, if the price has remained the same. So, the price is 5 rupees only, but the marginal productivity of labour has changed. So, we have increased the marginal productivity by providing more training to the labour. Now, in this case, if the wage rate remains the same, then even the sixth labour will be hired because the value of the marginal product of the labour is 200 rupees; whereas, the wage is only 100 rupees. So, what we are observing here is that if you increase the marginal product of the labour or if you increase the price of the output, the value of the marginal product of the labour increases and this would change the demand for the labour. It would determine how much labour is going to be employed and the marginal product can increase by increase in productivity or it can increase by the supply of other factors such as raw materials.

What we are saying here is that if the labour gets trained or the labour gets say a better stove or the or we increase the supply of other factors such as say the fuel, then the total marginal product for the labour would increase and even if the price remains the same, the value of the marginal product in this case will increase and we have seen that if the value of the marginal product of labour is greater than the wage rate, then the person gets hired. If the value of the marginal product of labour is less than the wage rate, then the person does not get hired in the case of a profit maximizing firm. So, this determines what will be the number of labour that get employed.

So far, we were looking at the demand side, what about the supply side? The supply of labour depends on the number of factors such as the trade-off between work and leisure or the value that is given to leisure. Now, if we have a society in which leisure is given a very high value. So, people put a very high premium on the time they are able to spend in say chit chatting or watching movies or with their family or say wandering around. If this leisure is put at a premium, then people will have less incentive to leave this premium of leisure and go and work. So, it would depend on how much is the premium that we pay to leisure in a society.

In certain societies, we say that work is worship and so, people are more incentivized to work because of the social set up. But in certain other societies, it is possible that there is a social norm of valuing leisure at a very high premium, in which case people will be less inclined to work. It also depends on the social tastes and traditions, whether women prefer to work outside home or not; whether they are permitted to work outside or not by the society, so that will also determine whether or not women are there as a part of the labour supply pool or not. In certain societies, we can have a situation where even teenagers go out to work. In that case, the labour supply will be more. In certain other societies, the teenagers just do not go out to work. So, the labour supply will be reduced.

In certain societies, people put a very high premium on education. So, in that case people even in their early 20s will not be available in the labour supply. So, the social taste, the traditions also determine to a very large extent, the amount of the supply of labour. Then, it also depends on the changes in the alternative opportunities that people have. With the end of the agricultural season, the labour supply to the industries goes up. Why? Because the amount of employment that was available to the agricultural sector dries out, because the agricultural season has ended. So, when that happens, the supply of labour for industries increases and it also depends on immigration and the movement of labour. So, if more people come into a society or in a country say through immigration or through movement inside the country. So, in that case, the labour supply will increase. So, there are a number of things that determine the supply of labour.

And as in the case of the market for goods and services, here again we have an equilibrium in the labour market. So, there is a demand for labour, there is a supply of labour and the point where both of these curves intersect, this point will give us equilibrium. And at equilibrium, we will have the quantity of workers that are demanded. So, this is the quantity of workers that is demanded or supplied which tells us the equilibrium employment in this particular market situation. So, this is the number of workers that will get employment and they will get employment at a range that is at a wage that is given by this equilibrium wage. So, this is the equilibrium wage and the equilibrium employment.

And just as in the market for goods and services, we can have a shift in the labour supply; the supply may increase, the supply may decrease. For example, in the beginning of the agricultural season, the supply of labour to the industries will decrease. At the end of the agriculture season, the supply of labour to the industries will increase. If we have alternative employment opportunities, then the supply of labour will decrease to firms. So, there are a number of ways in which we can have a shift in the labour supply.

We can also have a shift in the labour demand. So, a good example again talking about the agricultural season. If there is the beginning of the agricultural season, then the demand for labour for working in the agricultural sector will go up. So, the demand increases in this case. At the end of the agricultural season, the demand for labour in the agriculture sector will go down. Now, when there is a shift in the labour supply, a shift in the labour supply is shown by these red curves. If there is an increase in supply, it is shown by this shift to the right; if there is a decrease in supply, it is shown by this shift to the left. Now, if demand remains the same and we have an increased supply. In that case, this is the new equilibrium.

In this equilibrium, with more labourers, they get employment; but the equilibrium wage rate is less. With an increased supply, with no change in the demand, we will have more workers that are employed; but at a lower prevailing wage rate. On the other hand, if there is a decrease in the supply such as in the beginning of the agricultural season, the supply of the labour to the industries decreases. So, in that case, less number of workers will be employed in the industry; but they will get higher wages. Similarly, when there is a shift in the labour demand; so if there is more demand, more demand is shown by the demand curve that is shifting to the right. So, this is an increase in demand, with an increase in demand the equilibrium shifts and this is the new equilibrium, this was the old equilibrium.

Now, with the new equilibrium, the equilibrium quantity of workers has increased. So, more people get employment and at a higher wage rate. On the other hand, if there is a decrease in demand as shown by a shift to the left in the demand curve, so we have this new equilibrium and at this equilibrium, this is the equilibrium quantity and this is the equilibrium wage. So, if the demand decreases, then we will have reduced wages and less number of workers that get employment. A good example is the employment in the agricultural season; in the agricultural sector at the end of the agricultural season. So, we can have a change in or a shift in the labour supply and demand and that will affect the equilibrium and that will affect the number of workers that are employed and also, the prevailing wage rates.

Similar to the market for labour, we have a market for land. When we talk about the factors of production or the market for the factors of production, we have three factors of production; land, labour and capital and similar to the labour market, we also have a land market, we also have a capital market. In the case of the land market, we have a demand for land and we have a supply of land. And both of these curves intersect together and this gives us the equilibrium quantity of land that is supplied to the firms and the equilibrium price at which the land is supplied. Now, in a number of cases, the firms do not buy the land; but they take the land on a rental basis which is a lease.

In most of the situations, we talk about the rental price of land which is how much you need to pay for a fixed piece of land, say per year or per decade. So, in the land market, we have an equilibrium quantity of land and we have the rental price of land.

Similarly, in the capital market, we have the demand for capital, we have a supply for capital; both these curves intersect at this equilibrium point, which gives us the quantity of capital that is demanded or supplied by the market and the rental price of the capital. Now, in a number of cases, this rental price is the interest rate that the firm is going to pay to get this capital. So, if say a company raises a debenture and in the case of a debenture, if you buy a debenture, then the company will pay you an interest rate. Now, that is telling us the equilibrium price for the capital. Now, if the company has a very huge demand for capital, then probably they will be paying a more price. So, this equilibrium in the market will tell us the quantity of capital and the rental price of the capital.

Just as before the demand will depend on the value of the marginal product of the factor that is in question. That is the value of the marginal product of land or capital. If the value of the marginal product is more, then these factors will be in more demand and probably, the firm will be ready to pay a higher price. If the value of the marginal product is less for any of these factors, then the demand will be less and probably, the company will be ready to pay less. Now, for a competitive and profit maximizing firm, each factor's rental price equals the value of the marginal product of that factor.

We have seen that in the case of labour, the value of the marginal product of labour is equal to the labour's wages. So, the company is going to hire only till this point, where the value of the marginal product of the labour is greater than or equal to the wages or is greater than or equal to the rental price of the factor of production. So, the factors earn the value of their marginal contribution to the production process.

And because these three factors of production, land, labour and capital they are linked together, because all three of them are together needed for production. So, in this case the supply of any one factor can alter the earnings of all the other factors and a good example is an epidemic that reduces the labour supply. So, if there is an epidemic and people are dying or people are sick because of it, they are removed from the labour market. So, in that case, the supply reduces. Now, when the supply reduces, the marginal product of labour rises. Why? Because of the Law of diminishing marginal product.

If you have more labour, then you have less marginal product. Remember that we are talking about the product, the production that is being made by one extra unit of the labour. If there is more labour, then the amount of production that is made by one extra unit is less. So, it means that if you have more labour, then there is less marginal product which means that if you have less labour, then you have more marginal product and if you have more marginal product and everything else remaining the remaining same, that is the price remaining the same, the value of the marginal product will increase and this will increase the wages.

But because of a shortage in the labour supply, the marginal product of the land will decrease. Why will it decrease? Because less labour is able to work the land and, in this case, there will be a decrease in the rent and similarly, the marginal product of capital will decrease because less labour is able to work the capital and so, this will decrease the return on the capital. What we are observing here is that if the value of the marginal product of any factor of production increases, it increases because of a change in the supply and we are taking the example of an epidemic that reduces the labour that is available.

With less labour available, we have a greater marginal product of labour because of the law of diminishing marginal product and in that case, the value of the marginal product of labour increases, which will increase the wages that the labour will get in the market. But because less labour is available, so the value of marginal product of land or capital, it will decrease because less labour are able to work on the land or the capital and so, the productivity of land or capital will decrease, which will reduce the rent or the returns for the land and capital.

Such an analysis is known as the neoclassical theory of distribution. What are the salient points that we have seen so far? The amount paid to each factor of production is derived from the supply and demand for that factor in the market. So, we have seen before that, there is a demand and there is a supply and both of these together are telling us the amount that is paid to each factor of production which is the rental price or the wages. Demand for a factor depends on its marginal productivity. Because if the marginal productivity is more, then the demand will also increase and in equilibrium, each factor of production earns the value of its marginal contribution to the production.

So, you earn more, if you contribute greatly to the production of something that is valued high; meaning that, if you have a larger productivity and the product that you are working on or the product that you are making has a higher price in the market, then because you are making more of those goods that are priced higher, you will earn more. And the corollary is that a person will earn less, if his or her contribution to the production is less; meaning that the productivity is less or the product that is being produced has a lower value.

So, people who work in the primary or secondary sectors of the economy, that make such products that have a low value in the market will earn less and especially so, if their productivity also is less. This helps us explain why there is poverty in the society and as we have seen poverty has a great ramification for the cause of conservation.

That is all for today. Thank you for your attention. Jai Hind!

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Module 10
Labour market economics and Conservation
Lecture 2
Earnings and discrimination

Namaste! We carry forward our discussion on Labour Market Economics and Conservation and in this lecture we will have a look at Earnings and Discrimination.

Before we begin let us recap what we had observed in the previous lecture. In the last lecture we had a look at the new classical theory of distribution and in that we saw these salient points, the amount paid to each factor of production is derived from the supply and demand for that factor.

Which means that, in the case of the labour market the demand for labour and the supply for labour will determine how many people get employed in the market and what is the rate at which they will be paid or the wage rate.

Second the demand for a factor depends on its marginal productivity which means that, if there is a person who is who is giving out a larger amount of output. So, his or her marginal productivity is higher and in that case the wages that will be offered will also be higher. Third, in equilibrium each factor of production earns the value of its marginal contribution to production which means that, if somebody is contributing greatly to the production of something that is valued high.

In that case the person will be earning more and a good example is people who work in making software that is valued highly and they are putting in the major share of making that software. So, in that case such people will be earning a lot more than those people who are working to make something that is not valued that high or those people who are working to make something that is valued highly, but are putting in a very small or a minuscule contribution to the actual making of that product.

A good example is a person who is working for the security of the premises where the software is being made. So, this person is not putting a very major share of contribution in the making of the software and in that case the wages that are offered to such a person will be much lesser than the wages that are offered to a software engineer who is actually making the software that is valued highly.

And it is currently said that if somebody is putting in a contribution to a production of something that has a lower value or when the contribution to the production is less, then in that case the person will be earning less which ultimately gives rise to poverty.

In the previous lecture we were analyzing what causes poverty because we have seen that poverty is intimately related to conservation. Now this is because if the society is poor then in a number of cases we have observed that the population size will increase people will have less per capita resources which would mean that their marginal productivity will be less and to feed the large population or to get resources for the large population when the marginal productivity is less the only option would be to expand into the forest areas.

In that case the forest will be indiscriminately cut and converted into agricultural fields, but still because the forests are generally in those areas that do not have a very good fertility. So, the marginal productive productivity will still remain less, the people will still remain poor, but in this case the forest will also be gone which is why it is important to understand that, why poverty arises in the society.

But then apart from the neoclassical theory of distribution there are also a number of other factors that determine how much a person is paid. And in this lecture we will look at some of those factors.

What are the factors that modulate the predictions of neoclassical theory? Now one such modulating factor is the compensating differential. Compensating differential is defined as a difference in wages that arises to offset the non monetary characteristics of different jobs and good examples are night shifts or dangerous jobs.

What we are saying here is that several jobs have certain non monetary characteristics, which is a way of saying that there are certain jobs that do not have a very big difference in the amount of remuneration that they will provide, but they have certain characteristics that differentiate them against each other. So, a good example is a person who is working as a security guard.

Whether this person provides security in the day time or whether he provides the security in the night time the kind of service that he is providing is the same which is security. The amount of input that he would have to make in keeping himself attentive to the details is roughly the same. But still it is easier for people to work in the daytime than in the night time. So, this is a non monetary characteristic of this particular job, whether a person is going to work in the daytime or in the night time.

Now because working at night time is more difficult. So, people are paid more, now in this case they are being compensated for a difference in a non monetary characteristic.

So, the difference is whether they are working in the daytime or in the night time and this non monetary characteristic differential is getting compensated. So, this is a difference in wages that is arising to offset that is we are trying to nullify or we are trying to compensate for the non monetary characteristics of different jobs.

Examples are night shifts that pay more or dangerous jobs that pay more, for example coal mining. A person who is working in a sector to carry load from one place to another place that is a person is working as a porter will be earning less money if he is doing the work of a porter in a market or say in the railway station, but he will get much more amount on much more amount of compensation or wages if he is working say in a coal mine, why?

Because coal mines are generally dirty places to work, they are generally dangerous places to work because at any point of time an accident can happen with a greater probability, than an accident occurring say in a market area.

Because people have to be lured to work even in these difficult surroundings or in these dirty surroundings. So, they will have to be paid more and this is known as the compensating differential, this is a compensation for the differential characteristics of certain jobs.

Especially, depending on whether they are more difficult or whether they involve working in a dangerous situation or in dirty situations. So, this is known as a compensating differential and this modulates the predictions of the neoclassical theory.

Another difference that modulates is the human capital. Now human capital is the accumulation of investment in people such as education and on the job training it is an accumulation of investment in people that is how much amount of investment has been accumulated in a person by means of things such as education or on-the-job training and a good example is that income increases with education and income increases with training and experience.

What we are observing here is that if we talk about people having the same experience, but different education levels doing the same job. Now if you remember when we were talking about the neoclassical theory of distribution we were saying that the amount paid that at equilibrium each factor of production earns the value of its marginal contribution to the production process. Now in this case what we are observing is that people are doing the same job. So, the neoclassical theory of distribution would say that these people should be paid the same amount.

In actuality what we are observing is that people have paid different amounts. So, a person who is a graduate of the high school is paid less, a person with a certificate or diploma is paid more than the high school graduate, a person with a bachelor's degree is paid even more, a person with a masters degree is paid even more and a person with a PhD is paid even more. Now even though these people are doing the same job and they have the same experience. The only difference is the difference in the education levels.

In this case what we are observing is that we are paying these people more on account of the accumulation of investment in the people by means of education or training. So, this is a modulating factor. Because of this factor the neoclassical theory of distribution does not exactly apply. So, this modulates the results of the neoclassical theory to some extent.

Here again a person who is working in a sector that is making things that are valued very high in the market and is putting in a major contribution will be earning more than a person who is putting in a smaller contribution or a person who is working in a sector whose output is not valued that high.

The neoclassical theory still remains. If we talk about two people who say our software engineers. They will still be paid more than say two people who are working as security guards, but among these two software engineers the one who has got more education will be paid more.

This is a payment that is being made on account of the greater education that this person has. This is a payment on account of the human capital that has been accumulated in this person by means of higher education. So, this is human capital that modulates the results of neoclassical theory.

The question is why should somebody do that? Why should a firm pay more to a person who has a higher amount of human capital accumulated in that person. And there are several reasons, one education and training increase the marginal products of labour and this is true to quite an extent, education and training increase the marginal products of labour.

What we are saying is that if there are two people who are say working as software engineers and one person is just a novice he has just come out of a college. And there is another person who has accumulated a lot of training by working in some other company or he has acquired education by working in an academic institution. So, he has gained a masters degree or a PhD degree.

What happens is that when the person has been working in a particular sector or has gained a higher education in that particular sector, then they are exposed to a lot more challenges, a lot many problems than a person who is a novice who may not have been exposed to those challenges. Now because of these exposures and because of having an ability to solve the problems in those situations in a number of cases people learn how to tackle certain situations.

For instance if there are two software engineers and there is a particular bug that has come up or corrupt into the software then a person who is more experienced either by account of a higher training or by account of say a higher education he will be in a much better position to find out where the bug lies because in his lifetime he has experienced several setbacks in several sorts of course.

Whereas, a novice may not have been exposed to so many problems and so he will have to start from the scratch. So, in this case the marginal productivity of the person with higher education or with higher training will generally be higher. This is the first reason that education and training increase the marginal products of the neighbor and. So, the human capital leads to a higher payment as in the case of the neoclassical theory of distribution.

Another reason is that higher education is the compensating difference for the cost of education both in terms of opportunity cost and time involved. What we are saying here is that the higher income of the people who are educated more is the society's way of compensating them for the troubles that they have taken, troubles in terms of the opportunity cost.

That is if the person with the higher degree had not gone for higher education he or she would have been working somewhere and by working somewhere they would have been earning some amount of compensation, some amount of payment.

To get the higher education they had to forgo this payment. There is an opportunity cost that is involved. A person who is going for a higher degree is not going for the work in the labour market and the society needs to compensate that person for the loss of that opportunity.

The society compensates for the opportunity cost and the society also compensates for the time that is involved because a person who goes for a higher education for a higher degree has to spend a lot of years in an educational institution working on say very theoretical subjects.

This person, by working on these theoretical subjects, will also gain an insight into problem solving. That will increase the marginal productivity later on, but currently when the person is there in an educational institution he or she might feel that there is a huge amount of and there is so much of the time that needs to be invested into higher education.

All this needs to be compensated by society. Later on when the person joins the job market and the higher income to people with higher education is the way of society compensating for this loss of opportunity and putting in so much time which is the cost of education. In this case what we are saying is that because education is difficult. So, society needs to compensate for this difference.

That is similar to the case of a person who was working a night shift or who was working in a dangerous profession. They need to be paid more because there is a level of difficulty involved there is a level of danger involved.

Similarly a person who has put up so much of the cost into education in terms of opportunity cost and time will also have to be compensated for because higher education typically is difficult and the third reason is that education and training are signals for higher ability.

What is a signal? Signaling is defined as an action taken by an informed party to reveal private information to an uninformed partner signaling is an action taken by an informed party, which means that when we talk about a person who was getting into an employer relationship with an employee.

Suppose I am the owner of a firm and I need to check who is the best person for the job. Now I do not know how good person A is or how good person B is. Now they are having this private information that probably person A knows that he is an extremely lazy person, but in the interview person A will not tell me that sir I am a lazy person. Probably person two is completely disregardful of punctuality. So, it is possible that person when I hire him then probably person two will never come to the office on time because he is completely non punctual.

But then person two will not come to the interview and say that I am a person who pays no punctuality. Both these people when they come for the interview to get the job they will be projecting themselves as the best person for the job. So, both of them would say sir I am a very hardworking person and I am a very punctual person. Now the employer when he needs to know which person to hire, how is he to extract this private information?

Because nobody is going to tell the employer that these are my limitations, we have a situation where there are certain people who have this private information about their abilities and about their disabilities and there is another person who is the employer, who needs to extract this private information out of these people.

Herein comes signaling. It is an action taken by an informed party to reveal the private information to an uninformed party. So, what will both of these people do? These people suppose person two says that sir I am having a so and so degree from a second set institution then this is a signal that person two is providing.

In that case the employer finds it much easier to judge whether he should hire person one or person two because the employer would think that ok I have these two people and both of them are saying that they are the best person for the job, but then the first person does not have a higher degree the second person has a higher degree from a very prestigious institution.

It means that person two was able to secure an admission to that prestigious institution and at the same time person two was able to pass with flying colors. I can see his grade sheet. So, I can see if this person is able to put up hard work or not. So, this is a signal now it is very similar to, say, a peacock when it dances. When a peacock dances it splits its feathers for the peahen to see if this peacock is fine or not.

When peacock and peahen are mating in the mating season the peacocks will show off their wings and, if there is a peacock which, say, is a diseased peacock, in that case the disease will show itself in the wing patterns, because a peacock that is a diseased peacock that is not getting

enough resources then in that case probably the feathers will not shine that much. Probably it will have fewer feathers than a peacock that is in the prime of itself.
By showing themselves law the peacocks are giving a signal to the peak end that this is my ability this is my level of health status and similarly in the case of education people can use their education as a signal to tell the prospective employer that these are my abilities.
If I have a degree from such and such institution it means that I am able to put up hard work. It means that I am a punctual person. So, whatever the other person says that is immaterial you can just have a look at my grade sheet and you can make your own choice, so that is signaling. So, education has a very important role in signaling.
Similarly, training because if a person has been hired by say a very prestigious form before. Then the employer will get this idea that if this person could work in this firm then probably this person is a good person. He will be an asset to our organization as well because he has already worked in such a prestigious position.
So this again is a signal. Signaling is an action that is taken by an informed party to reveal private information to an uninformed company. Now there are certain characteristics of good signals; these signals must be costly so that everyone does not get to use them, which means that if you use a signal suppose there are two candidates who have come for a job interview and the first candidate says that sir I am very fond of Jagjit Singh songs, the second candidate says sir I am very much fond of Kishore Kumar songs.
Now in this case whether a person listens to Jagjit Singh or whether he listens to Kishore Kumar that has got little to do with the kind of one that is involved in the form. And at the same time it is very easy to get Jagjit Singh songs or Kishore Kumar's songs because these days everything is available on the internet and people can listen to these songs or watch these songs on radio or television. So, people have easy access to these whereas, for a signal to work properly it should not be. In this case the song that a person hears will not play the role of a signal because the employer would say that how does it matter because to get this signal to listen to say Kishore Kumar songs or Jagjit Singh songs you do not have to enter a very huge amount of cost.
There is no great cost involved. Whereas, in the case of education it is extremely costly both in terms of money for fees, both in terms of opportunity cost that somebody has to give up and also in terms of the time that one has to put in.
So signaling will only work when it is costly so that everyone does not get to use them and education is costly. Secondly, signaling will only work when it is something that should be more costly for the lesser quality product than for the higher quality product which means that if there are two people one listens to Jagjit Singh the other listens to Kishore Kumar then there is no difference between these two people in terms of their abilities.
Whereas, in the case of education if somebody says that I was able to secure this grade at this institution, in that case a person can very easily make out that doing this thing was difficult for a person with lesser ability, but doing this is easier for a person with higher ability. So, passing is easier for a person who is hardworking or who is intelligent or who is diligent, but passing is more difficult for a person who is lazy or unintelligent.
So in this case there is a differential costing involved which means that signaling is cheaper for a

person with a higher quality or with a higher ability, but signaling is costlier for somebody with a lesser ability.

So, education becomes a very good signal because it is easy for somebody who is having the desired qualities, but it is costly or even costlier for a person with lesser abilities. A person who is having a lesser ability in terms of say doing problem solving or in terms of putting up punctuality or working hard.

Now this person will find it extremely difficult to pass a course whereas, a person who is hard working will easily pass the course. In this case there is a difference that exists between a person with a higher quality or ability and a person with a lower quality or ability; this is another characteristic of a good signal. It should be more costly for a less quality person or product than for a higher quality product or person.

Whereas, if you wanted to use listening to a song by Kishore Kumar or Jagjit Singh as a single, then there is no difference between the cost for a higher quality product or a lower quality product or person.

So a person with a higher ability will also find listening to these songs equally easy or difficult than a person with a lower quality. So, it does not work as a signaling. Signaling should be something that is costly and this cost should be different for people with different abilities and because education is both costly and it has a differential costing for people with higher and lower abilities. So, it acts as a very good signal.

Now if a person has a higher degree from a more prestigious institution then it acts as a very good signal and the employer will make this decision that yes this person is intelligent and this person is hard working and this person is punctual and you can add n number of other differences here. So, signaling modulates the results of the neoclassical theory.

Another thing that modulates the results is the ability, effort, chance and appearance ability. So, higher ability people get higher wages and this ability may be a result of hereditary upbringing, exposure and so on.

What we are saying here, is that suppose you have two people who are working in a job say they are working as porters. Now a working person has a higher ability which means that he can work for longer hours and he can pick up heavier weights. Now this person with the higher ability will at the end of the day earn more than a person with a lower ability. Now this is because the person with the higher ability is able to put up a greater marginal product.

In this case what we are saying is that people with higher ability get higher wages. It is not necessary that this ability stems just from the person, but it may be a result of heredity, upbringing, exposure and so on.

A person who is born to intelligent parents may be intelligent because he got intelligence in heredity. So, even though this person is not putting up that much of an effort, still this person is able to pass easily.

In that case he will be able to get an education with lower effort, but then once he gets this education it will act as a signal in the market or this difference in ability may be because of a difference in upbringing. There could be a case in which the parents have inculcated the tendency in their children to work very hard. In the other case you can have parents who have not inculcated

this ability.
In this case the upbringing would lead to a difference in the ability because at the end of the day the child one when he grows up he will be working very hard as compared to child two because it is there in his upbringing.
From early childhood on he knows that he needs to work hard and. It is now a part of his character, it is a part of his nature. Upbringing can also make things exposure can bring changes in ability. A person who has worked in different sectors or a person who has worked in different countries and is exposed to different sorts of problems will have a higher ability for problem solving than a person who is not exposed to these things.
Exposure may change ability and in the case of ability a person with higher ability will typically get a higher wage even though both of these people are working in the same sector. Effort, a person who is putting up more effort is paid more than a person who is not putting up enough effort.
Basically if there are two candidates both have equal abilities, both have equal education, but what happens is that person one works for 12 hours in a day, but person two works for only 2 hours a day the rest of the time it does not work.
In that case because person one is putting up more effort. In that case he will typically earn much more in the market. He will be getting a higher wage than person two. So, the result of the neo-classical theory of distribution is modulated by the effort a person puts in higher effort means more wages. Chance, now this is a very important factor students who are graduating during a recession time will get paid less.
Now, these students may be having the same ability, they may be putting up the same amount of effort than their previous generation of students, that is their seniors, but just because the market is in a recession period.
In that case it may be more difficult to get a job or it is also possible that the job that these people get will be paying them less. Now this is not because of any difference between the students of this class and the students from the previous class.
It is just a luck factor, just a chance factor. People who graduate during times when there is a recession typically get lower wages. A chance factor is also involved, appearance is also involved because good looks may be needed for certain jobs with public exposure.
If you talk about a job such as that of a news anchor. A person who looks better, who has a better appearance may be paid more actors. Now in the case of actors, if they look beautiful, if they look smart they might need a higher payment.
Appearance may play a role especially in those jobs that involve public appearances say in the case of TV or cinema good looks are also a signal of upbringing and an availability. So, they might be needed or they might act as a signal.
Now it is a signal of upbringing and ability. For example, does a person know how to tie a tie or not? In this case it is acting as a signal because if a person knows how to wear a tie properly, if a person knows how to wear a suit properly then probably they have been brought up in an environment where these things were already taught to them.
With these, people can read out certain deductions about the qualities that people might have not because you have an indication of the kind of upbringing this person has been through. So, good

looks might also be a signal. And in certain cases the beauty premium may be just a form of discrimination. So, ability, effort, chance and appearance regulate the wages.

Then we have the superstar phenomenon that regulates wages. People like Lata Mangeshkar or Sachin Tendulkar or Amitabh Bachchan earned way above their colleagues. They are the superstars of society. Lata Mangeshkar earned much more than other singers of the same time who were probably putting up the same amount of effort, but those singers were getting paid less, but Lata Mangeshkar was getting paid more. Sachin Tendulkar got much more income from playing cricket than another person who was probably putting up the same amount of effort. Now, why do we have these people who get way above the average wage rate that is prevailing in the society?

Not all the singers get paid equal to that of Lata Mangeshkar, not all cricketers get paid equal to that of Sachin Tendulkar, not all actors get paid equal to that of Amithab Bachchan. Now, this is the superstar phenomenon and it happens when every customer in the market wants the goods supplied by the best producer.

So basically, if you have a chance to watch a movie by Amitabh Bachan or by or watch a movie by an actor who is completely unknown. So, people would generally think that because Amitabh Bachchan is so good at acting. So, let us watch that film. So, people want to have the product of the best producer of that particular good. Lata Mangeshkar is probably the best singer. So, she is the best producer of songs, especially Hindi songs.

Sachin Tendulkar is the best producer of the entertainment or the thrill that you get by watching cricket and most of the people want to have the best and the good that is produced is. If it is possible to provide it to every customer at a low cost it is possible to provide it to every customer at a low cost - so what we are saying here is that suppose the good is something like the work of a doctor. Now in this case a doctor when he is treating one patient will not be treating another patient at the same time and. Depending on the demand and supply in the market the amount that the doctor will charge to the patients will change. If there are very less number of doctors and there is a very great amount of demand then probably the doctor will start charging more.

So, there will be a natural equilibrium in the market and you cannot provide the services of a doctor to everybody at a very low cost, but what happens in the case of professions such as cricket or profession such as acting. Once a movie has been made it can be shown to n number of people for a very low cost.

These days when we watch a movie on a streaming medium it hardly costs anything to watch the movie. So, everybody can now afford to have the services of the person who is the best producer of the good in the base of a doctor not everybody gets a chance to afford the services of the best doctor.

Whereas in this case the good is being produced and distributed in such a manner that everybody can afford to have the good of the best producer.

So everybody can watch Sachin Tendulkar play on the TV screen, everybody can listen to Lata Mangeshkar songs at a very low cost, everybody can watch Amitabh Bachchan act in a movie at a very low cost. And it is only in these professions that we start to observe the superstar phenomenon. So, in the case of the superstar phenomenon you have certain superstars who get paid way

above their colleagues.
Because there are two things: one they are the best producer of the goods that they are producing, and every customer in the market wants to have the goods supplied by the best producer.
And second, the goods are being produced in such a manner and distributed in such a manner that it is possible to provide it to every customer at a low cost. In that case everybody will just flock to the best producers of the good and. The best producers will be earning way above the second best which is not the case say in the case of doctors. The best doctor may not be earning way above the second best or the third best.
But in the cases of superstar phenomenon the people who are the best they earn way above the second best or the third base. That is the superstar phenomenon and this is something that is not explained by the neoclassical theory of distribution.
This is another factor that modulates the wages that people get in the market, if they are working in a sector that permits them to provide the goods at very low cost and when they are the best in the field and they are working in a in a sector where everybody wants to have the goods or services by the best in that case they might be earning way above the crowd that is the superstar phenomenon.
Another modulating factor is the case of above equilibrium wages because of the minimum wage laws. So in this case the government is influencing the wages that people will be getting. The neoclassical theory was saying that people are getting wages that are equal to the value of their marginal product of labour, but the government may tinker with it and the government may say that no this is the minimum that you will have to pay these people.
We have observed that in the case of a non binding price floor. Suppose the government has put up this price floor that this is the minimum wage. In this case the law department is saying that this is the minimum wage that you need to pay. And suppose the market is paying above this minimum wage. So, this is the natural equilibrium in the market then we do not have an impact of the non binding price floor.
But in case the minimum wage which is shown by this red line is more than the natural market equilibrium that is shown by this point. In that case there will be a difference between the quantity that is demanded at this price. Quantity demanded is given by this point where the demand curve is intersecting with the price curve or the price floor curve.
The quantity that is supplied is given by this point where the supply curve is intersecting with the price curve. In that case we will have a quantity demanded that is less and a quantity supplied that is more and we will start to observe a surplus in the market. So, the actions of the government may tinker or modulate the results of the neoclassical theory of distribution.
In these cases we can have a surplus, a situation in which the quantity supplied is greater than the quantity demanded impacts selling is possible only for a few sellers. In this case workers who can appeal to racial familial or other ties what we are saying here is that in the case of minimum wages because there is less demand there is a huge amount of supply.
Not everybody gets paid, not everybody gets work and those people who can appeal to say familial ties or their cultural ties or their linguistic ties they might get employment and other people will not get employment.

Now the neoclassical theory of distribution was saying that every person is getting paid according to the value of their marginal product of labour, but in the case of such government interventions, it is possible that two people who can put up the same value of marginal product of labour one of them gets employed the other one just does not get employed. So, this is a modulation: it may result in losses to sellers due to unsold inventory. In this case the sellers are the workers because they are selling their labour.

So there will be losses: there will be losses for the workers because of their unsold inventory in terms of unemployment. The workers in this case have labour to offer to the market for a price, but because the price has been increased to a level above the market equilibrium.

So, nobody is hiring them. This is a loss to the workers and this may also have a long term impact in terms of closing of industry or job losses because the price is a bit too high for people to pay. So, in that case it will be difficult for people to run their industries or it may be difficult for at least some people in their industries.

And because of that they might close the industries which will create even greater unemployment. So, this is another modulating factor to the neoclassical theory of distribution.

Another example of or another case of above equilibrium wage is union. Unions can do collective bargaining and use strikes to demand above equilibrium wage. In this case the workers will not get paid according to the value of their marginal product of labour, but the neoclassical theory of distribution was same, but in this case what the unions do is that they go for a collective bargaining and they say that if you do not pay as this much amount they will strike.

A union is a worker association that bargains with the employers over wages and working conditions and strikes are the organized withdrawal of labour from the firm by a union.

In this case the union says that if the firm does not pay us or pay the workers at this rate, we will not permit anybody to work. Now this is very similar to the case of the minimum wages that are put in place by the government.

Even in this case the wages that are demanded are above the natural equilibrium of the market and we might also observe that in a number of cases because of these strikes or because of the inability of the firm owners to pay this high a wage they may just close the industry. So, there will be a huge amount of unemployment, but this is also another case that is modulating the results of neoclassical theory.

And third is the use of efficiency wages by firms to raise productivity, retain good workers, reduce turnover or reduce expenses of hiring and training. And in this case the efficiency wage is described as the above equilibrium wages paid by firms to increase the worker productivity.

In this case there is no role of government. The government is not saying that the firm should pay above the market rate, the workers themselves are not saying that the firm should pay us above the market rate, but the firm in its own best interest pays the workers above the market rate.

Now why should firms do that then this is because even when one person is fired and another one is hired, we can achieve the same quality at the same rate, but the process of firing and hiring them are also expensive processes because the firm will have to put up an interview.

It will have to call for applications, it will have to search all these applications, it will have to interview, there will be a decision making that will have to be made and all of these require costs. So, the company might say that ok the people who are working for us and we know that they are working well let us pay them a bonus so that they do not also have an incentive to go to another company. So, they will not leave us and the amount that we would have had to spend to organize an interview, we will pay that amount to these people. So, our headache of hiring a new person is reduced and these people will go on working for us and we know that these are the good people. So, we want them to work for us.

So, the company might pay people or pay its workers above the market equilibrium in the aim to increase the efficiency of people or to retain the employees or to compensate for the alternative which would be to hire another set of workers.

So these are known as efficiency wages above equilibrium wages that are paid by firms to increase worker productivity or to retain good workers to lose turnover or to save the expenses of hiring and training. Now in this case because the firms are taking this decision out of their own free will there will hardly be negative consequences.

We also saw that another way in which the results of the neoclassical theory get modulated is discrimination. Now, discrimination is defined as the offering of different opportunities to similar individuals who differ only by a race ethnic group sex age or other personal characteristics.

When we talk about discrimination we are saying that there are two workers who are practically the same they have the same education they have the same ability, they will put up the same effort, but still we employ one and we do not employ other.

Because the one that we are hiring probably speaks the same tongue or belongs to the same community or the same religion. In this case we will say that we are discriminating one against the other.

It is the offering of different opportunities to similar individuals who differ only by race, ethnic group, sex, age or other personal characteristics. A good example is the gender pay gap, the average difference between the remuneration for men and women who are working.

Even though men and women might be having the same qualifications and the same education they might be putting up the same amount of effort, but in certain societies by tradition the women get paid less. This is the gender pay gap.

In our country the gender pay gap in the year 2007 was 44.8 percent and for the year 2013 was 24.81 percent. So, we are observing that as our society is modernizing the gender pay gap is reducing, but we still have a long way to go. So, this is an example of discrimination.

The market, in certain cases is able to solve the problem of discrimination by itself. Now, how is a free market able to solve this problem? In a competitive market a firm that cares only about profits will make products at a lower cost than firms that do discrimination because the firms that are doing discrimination might at times be hiring workers with lesser abilities or who are putting up lesser effort because they have this criterion of the person belonging to the same community as one of the criteria of hiring the people.

Whereas, another firm who is not discriminating and is looking only for profits this firm will be hiring the best workers. And in that case the firm that is not doing the discrimination end up producing the goods at a lower cost. Which could mean that, in in the medium or the long term this

firm that is not doing discrimination that will gain a larger share in the market because they are producing the goods at the lower at the least cost at the lowest cost.
And we have seen before that in the case of a competitive market the firms that produce good quality products at the lowest possible price are the firms that get the orders.
So over time the firms that care only about profits will out complete the firms that practice discrimination and thus a competitive market with free entry and exit can automatically remedy the employee discrimination. Which tells us that the free market has a free entry and a free exit, which means that any firm that is able to produce goods at a cheaper price and at a better quality is able to enter into the market. In that case the firms that are not doing any discrimination, because they are having the best workers they will make cheaper products with good quality, they will out compete those that are making discrimination and in a short while we will see that the market is only occupied by those firms that are not doing any discrimination.
The market is a way of tackling discrimination by the employees which is also why we say that markets are usually a good way to organize economic activity, but the sad part is that this may not always happen because in certain cases we observed discrimination by customers or discrimination by the government. Now if this is the situation then the market will not be able to solve this problem by itself. If customers are willing to pay to maintain the discrimination then free market will not by itself remedy discrimination.
By this what we are saying is that if customers say that we do not care about the quality we do not care about the price we only care about whether this product was made using workers of our own community. So, even though we get products at a higher price with a lower quality, that is ok with us as long as people from our community are getting jobs. Now in such a scenario the free market will not be able to solve the discrimination because people are paying for the discrimination.
In the theoretical context we had said that people are rational decision makers. So, everybody is trying to enhance their welfare by getting the the best quality material at the cheapest cost, but if people do not do this in this this relational decision making in that case the free market will not be able to solve the problem of discrimination.
In certain other cases the discrimination can also be government mandated example apartheid in South Africa. So, in certain cases the government may itself say that only people belonging to such and such communities are going to get employed. Now when discrimination is government mandated, then again the free market will not be able to solve the problem and in such cases legal remedies may be needed to counter such discrimination.
In our country we have a number of such legal provisions especially in our constitution. So article fourteen in our constitution says that the state shall not deny to any person equality before the law or the equal protection of laws within the territory of India. So, our constitution is saying that the every person is equal in the eyes of the law and will get an equal protection of laws article 15 says, the state will not discriminate the state shall not discriminate against citizen on grounds only of religion, race, caste, sex, place of birth or any of them.
The constitution says that nothing in this article shall prevent the state from making any special provision for women and children or for the advancement of any socially and educationally

backward classes of citizens or for the scheduled castes or the scheduled tribes.

The constitution is also saying that there shall be an equality of opportunity for all the citizens in matters related to employment or appointment to any office. The constitution is also saying that no citizen shall get discriminated against because of these factors.

We have the constitution saying provision of reservation then we have options like untouchability being abolished we have things like equal pay for equal work for both men and women.

What we are observing here is that in our country legally because of the constitution we have had several provisions that are aiming to remove or reduce discrimination.

Discrimination by the state is completely removed and in certain cases the societies that were discriminated against historically they have been provided a larger opportunity by means of reservations. And because of these provisions we also had a number of laws that were made: the equal remuneration act, the maternity benefit act, the factories act and we also have affirmative action in the form of reservation, special education and awareness opportunities. So, what the government is doing by all this is that in our country we are trying to remove discrimination

We can also touch upon the principle of economics that governments can sometimes improve the market outcomes because we saw that if the society is doing the discrimination and is paying for the discrimination then the free market will not be able to remove discrimination.

In this case the government can act. The government can say that you cannot discriminate and also the people that you have discriminated against we are going to provide them with greater opportunities. So, that they get a level playing field from background and. So, the government can sometimes improve the market outcomes.

And so to sum up, when we talk about wage determination the neoclassical theory of distribution says that the amount paid to each factor of production is derived from the demand and supply for that factor.

The demand for a factor depends on its marginal productivity and in equilibrium each factor of production earns the value of its marginal contribution to production. This is what the neoclassical theory of distribution says.

But we have observed in this lecture that the results of the neoclassical theory can get modulated by the compensating differential say in terms of more wages for difficult jobs or it can get modulated by the quantum of human capital how much is the amount of education and the training with the person it get modulated by the ability of person whether hereditary or otherwise by the effort a person puts in the chance factors whether the market is booming or in recession.

The appearance of the person can be modulated by the superstar phenomenon in those sectors where everybody wants the best product and these products can be made available cheaply to everybody.

They can get modulated by the minimum wage laws by the unions by the use of efficiency wages by firms or because of discrimination. So, there are a number of factors that can modulate the results of the neoclassical theory of distribution.

That is all for today. Thank you for your attention. Jai Hind!

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Module 10
Labour market economics and Conservation
Lecture 3
Income inequality and poverty

Namaste! We carry forward our discussion on Labour Market Economics and Conservation and in this lecture we shall have a look at Income Inequality and Poverty. We have seen before that poverty is intimately related to land and environmental degradation.

This is because poverty increases the amount of pressure on natural resources, because of which an over exploitation of natural resources becomes much more likely. Whether it is for fuel good or it is for agriculture or it is for meeting their daily needs of different people.

Poverty is intimately related to a lack of resources which might lead to an over population especially in the earlier stages of the demographic transition. Because of all of these there is an abundance of pressure on land and natural resources, because of which there is land and environmental degradation. This is the reason why it is very crucial for us to understand why poverty is there and what are the things that lead to poverty?

One very important topic when we talk about poverty is Income Inequality. Income inequality is the disparity of income distributions, it is the disparity which means differences in the distribution of income with a high concentration of income usually in the hands of a small percentage of the population.

When we say income inequality it means that there are some people in a society that have the largest amount of resources with them, they have the largest amount of money and the most assets with them. Whereas a large portion of the society has to go with very little amount of resources.

So, it is a disparity of the income distributions with a high concentration of income usually in the hands of a small percentage of the population. It means that even though the society in total would be having a large amount of resources, but because these resources are concentrated in the hands of a few people. In that case a large number of people would be poor and this poverty might lead to degradation of the land and the environment.

It manifests itself in wealth disparity, disparity in standards of living and disparity in human development indices. It results in a disparity in wealth that is the amount of money that people have disparity in the standards of living. In the same society you can have people who are using LPG or say electricity and you will also have certain people who are using fuel wood and disparity in the human development indices.

And disparity in the human development indices is one of the major reasons why poverty continues, because a person who is born into a family that is poor has less access to things like education or health.

In the absence of education or with a little amount of education this person would have little chance to move up in the economic ladder. So, a lack of education would mean that this person would not be earning large amounts of money when he or she grows up and that would mean that this person would continue to remain poor.

Similarly, in the absence of sufficient health infrastructure and access to health services, it is also possible that the person remains sick for a large portion of his or her life which would reduce their efficiency and with a reduced efficiency a person's ability to earn also reduces, which also keeps the person more and more into poverty.

Now, income inequality can be observed at the global stage and also at the local stage. So, when we talk about inequality in the world there are certain regions of the world such as most of North America, most of Western Europe and Australia and Japan that have a large amount of per capita income.

The people here earn much more as compared to countries in Asia or countries in Africa or some countries in South America where the per capita income is less and because the per capita income is less. The wealth levels also become very less.

The total assets that are there with people and the resources that people have are also less. So, we can observe that in the world stage there are certain rich areas and there are certain areas where people are mostly poor.

In our country we find a major difference in terms of the kinds of employment that people have. There are certain occupations where people get a regular source of income through their employment.

On the other hand there are certain people who work on a casual basis, which means that on some days they would be getting an income and some on some other days they will not be getting their income.

In our country if we look at the distribution of workers we will find that around 52 percent of people are self-employed, around 23 percent of people are having regular wages, that is they are working a regular job they may be salaried people and around 25 percent of people are casual labourers.

Now, these kinds of labourers may get an income on some day, on some other day they might not get any income. When we talk about this the people who are self-employed include professionals such as doctors and lawyers, but it also includes a large number of poor people especially the small shopkeepers or people who till their own lands the agriculturalists.

So, these people are self-employed, they are not working for wages, they are not working with someone else and at the same time they are not casual labourers. But in a large portion of these people who are self-employed the per capita income is very less and the people with a regular source of income are just around 23 percent of our population.

If we look at changes over time, the number of self-employed or the percentage of self-employed has hardly changed in between the years 2011-12 to 2017-18.

But the number of regular wage waged people or the salaried people has increased and the number of casual labourers has decreased, which in turn can be said to be a positive development. Because now more and more people are having regular sources of income.
This is the status of employment. If we look at the income share of people. Here on the x axis we have the decile, now decile means that when we talk about 1 it is the bottom 10 percent of the population.
The 10 th decile is the top 10 percent of the population, now with this curve we can observe that the top 10 percent of the population is having an income share of greater than 60 percent. Whereas, the bottom 10 percent of the population is having an income share of less than 1 percent.
This is a representation of the income inequality that we have in our country. There are certain people who are in the top 10 percent of the population who have a major share of the total earnings of our country. More than 60 percent of the income is being earned by only 10 percent of the people.
On the other hand there are other people who fall in the bottom 10 percent who do not earn even 1 percent of the earnings of the country. So, this is a good indication of the income inequality in our country.
We can convert this curve into the cumulative income state. Now, when we talk about the cumulative income share, what happens here is that when we talk about the 2nd decile. We are adding the income of the 2nd decile plus the income of the first decile. So, it becomes an increasing curve.
The 3rd decile will include the incomes of everybody in the bottom 30 percent of the population. So, in this case we are adding up the incomes. When we talk about the 10 th decile it will include the income of 100 percent of the people of India.
Essentially what we are observing here is that in the 10 th decile we have a 100 percent income share. If we talk about the 5 th decile it is the income of the bottom 50 percent of the population. Here we can observe that the income of 90 percent of the people of our country comes to around 40 percent of the total income of the country.
This is just another way of representing the income inequality that we were seeing so this was income share and this is a cumulative income share in percentage. Now, cumulative income share ensures that in the 10 th decile we reach a value of 100.
This is important because we can use a curve like this to compute the Gini coefficient of the country. If there was absolutely no income inequality, that is if everybody was earning the same income. What would have happened?
In such a scenario if we talk about any 10 percent of the population they would be earning 10 percent of the income of the country, 20 percent people would be in 20 percent of the income, 50 percent would be in 50 percent of the income and this is being represented by this straight line.
If we look at the 5 th decile it would reach 50 percent. If we talk about the 10 th decile it would be 100 percent. This is a 1 on 1 correspondence.
If the income of the country was distributed in such a manner that there was absolutely no income inequality, then these bars would have been touching this line. This is the line that shows

absolutely no income inequality, on the other hand this is the curve that is representing the data in these bars. This is no income inequality and this line is showing the actual position.

Gini coefficient is defined as this portion A divided by A plus B that is out of the total area of this triangle, how much of the area has been left out which is this portion A. So, this gives us the Gini coefficient of inequality.

If there is more inequality in the country in that case this curve would shift to this side and in that case the amount of A would increase and when A increases we will have more inequality. When A decreases when these curves just touch this line in that case A will be 0 and when A is 0 we will have a Gini coefficient of 0.

Gini coefficient is a way of representing the income inequality by a single number and this is how the Gini coefficient is determined. We find out the cumulative income share of the country, draw the straight line between different deciles and find out these 2 areas.

One thing is very clear that in our country we have income inequality. We saw that there is income inequality at the global level and we also have income inequality at the national level. Now, this income inequality manifests itself in the form of a number of indicators.

If we look at the indicators of inequality, this is data from the economic survey of India and if we look at the per capita net state domestic product at current prices that is 2011- 12 series as on date first of august 2019.

What we are observing here is that for any state we can find or say for most of the state what we will find is that the per capita net state domestic product has been increasing with time. That is overall the income levels of people has been rising, because the total produce of the state has been increasing and it has been increasing at a rate that is faster than the growth of the population.

Which is why we are observing an increase in the per capita state domestic product. But if we look at different states for any year, let us see 2011 and 12. The per capita net state domestic product for Andhra Pradesh is 69000 rupees.

But for Goa was more than 2 and half lakhs of rupees, for Haryana it was above a lack of rupees. So, what we are observing here is that different states are having different per capita net state domestic product. In the case of Bihar it was less than 22000 rupees.

The per capita net state domestic product of Bihar was less than 10 percent of that of Goa, which is telling us that there are certain states in which people are earning way more than what people are earning in the other states as much as a greater than 10 times difference. This is how we can observe the income inequalities at the state levels.

Even within the country we are observing that different states have been having very different per capita state domestic product and for most of the states though it has been increasing, but still we are finding that there are large differences.

If we look at 2017-18 Bihar the figure is less than 39000 rupees, but for Goa it is around 422000 rupees. Here again even though both have increased in their per capita net state domestic product. So, Goa has increased from 260 to 422 Bihar has increased from 21 to 38, but still the inequality remains.

Another indicator is the social indicator such as the life expectancy at birth. While the life expectancy at birth in the year 2013 to 17, if we look at Bihar it is 68.9 years but in Maharashtra it is 72.5years, in UP it is only 65 years, whereas in Kerala it is 75.2 years.

So, people in different states are having different life expectancies. Now, this is one result also of the amount of income that different people have in different states, because if people are earning more they can have access to more resources, say better healthcare or health care for a majority of the people. So, these things would increase the life expectancy.

Another indicator is the infant mortality rate that is out of every 1000 life births how many infants die in the first year. Now, here in the case of Assam the figure is 44, in the case of a state like Kerala the figure is 10. So, a child that is born in Kerala is having a much less chance of dying than a child that is born in the state of Assam, or a child that is born in the state of Madhya Pradesh. So, this is also because people in Kerala are earning more, they have better health services, they have much better antenatal care. Even before a child is born the mother is attended to and she is given medicines she is given adequate nutrition.

The income inequality will manifest itself in terms of differences in the human development indices of different states, differences in birth rate, differences in death rate. So, if we look at now a more developed state such as Kerala the birth rate per 1000 is only 14.2, whereas in a state like Madhya Pradesh it is 24.8. So, it is roughly double in the case of Madhya Pradesh.

If we look at total fertility rate in the case of Kerala it is 1.7, in the case of Madhya Pradesh it is 2.7 a large difference in the case of Uttar Pradesh it is 3.0, in the case of Bihar it is 3.2. What we are observing here is that there are different inequalities not only in the economic criteria, but also in the social criteria, in the demographic criteria and to a large extent these are also related.

Because what we have observed in the case of demographic transition is that when a society progresses. So, it has become more developed. In that case the birth rates would be less, the death rates would be less, the growth rates of population will be less and people will be spending more time in school. People will be having access to better health. So, better health and better education. We are observing all these different criteria in the social indicators.

Another indicator is the number of recognized educational institutions in the country in terms of different states. So, here we can observe that the number of education institutions in a state such as Karnataka is much greater than what we have in Arunachal Pradesh or in a state like Meghalaya.

Similarly, if we look at universities we will find that there are certain states that have a very large number of universities such as Karnataka and there are certain states that have less number of universities such as Nagaland.

So, there are differences everywhere the number of recognized educational institutions in a state such as Uttarakhand we have only 2 institutes under the ministry under different ministries, whereas in West Bengal we have as high as 12.

Now, what is happening here is that the more the number of institutes that you have in terms of educational institutions or institutions under the government, the better is the opportunity that is available to the people that are residing in those particular states. So, they have access to more institutions, they have access to more educational institutes, or training institutes where they can learn things or if we have a look at the state wide literacy rates.

If we take any state in a large possibility their literacy rates would be going down. So, if we look at Jharkhand it was 12.9 percent in 1951 and now it has reached as high as 66.4 percent. But then here again there is a difference.

If we look at a state like Kerala in 1951 they had 47.2 percent literacy rate a state such as Madhya Pradesh had to reach till the year 1991 to reach that state.

In the year 1991 we had 44.7 percent literates and Kerala was having a much greater percentage way back in 1951.

Now the literacy rate means that people have access to more job opportunities, they have access to newer technologies, newer developments they can incorporate or they can imbibe any new developments much faster because they are literates. And even today we can find that there is a difference in the literacy rates across different states.

In a state such as Bihar the literacy rate is 61.8 percent; in the state of Himachal Pradesh it is around 83 percent; in Kerala it is 94 percent. Here again what we are observing is that we have different indicators that are showing that different states are not the same.

There are differences or if we have a look at the number of households or the percentage of households with access to safe drinking water in India. In the state of Andhra Pradesh as many as 90.5 percent of households had access to safe drinking water in the year 2011. This is the census data.

But in 2011 they had 90.5 percent of people with access to safe drinking water, in the state of Haryana it was 93.8 percent Himachal Pradesh 93.7 percent, but in the state of Jharkhand it was as less as 60.1percent.

If people in a state do not have access to safe drinking water, it means that there is a greater possibility of those people falling ill to waterborne diseases. These indicators tell us what is the state of living in different states. A person who is much more probable of falling ill because of waterborne diseases will probably not be that efficient than a person who is safe from these diseases.

Because ultimately when a person falls sick the efficiency to do this reduces. People will have to take leave and so these are all different indicators that give us an idea of the level of income that people will be having.

If people have more access to health and education, their incomes will go on increasing. If you look at the population in different states it is different. If you look at population at in under different age groups child sex ratio, now child sex ratio is also a very good indication of the level of development of the society. Because if the society is giving equal weight age to the girl child and the boy child in that case we will find a much higher child sex ratio.

It would tell us that there are very less cases of female infanticide or female feticide and this is what we are observing. Indicators such as these can help us determine the level of development of different states.

In a state such as Gujarat is having a child sex ratio of 890, Haryana is having 834. But if we look at more developed areas such as Kerala you have the figure of 964 in the case of Karnataka it is 948. So, these are also very good indicators of the differential roles of different factors in different states.

So, a state that has a better child sex ratio probably has of women as compared to that of men,

which would mean that later on with these girls get into the age of employment they will be having better chances of getting an employment which would mean that they would also be earning.
In a family when more and more people are earning the income would grow up for the family as a whole. Whereas, for a family in which only the male members are earning the income is just half.
Similarly we can have a look at other factors such as the percentage decadal growth or the sex ratio at birth or the school education quality index and all these factors are different between different states. And these differences will also manifest themselves in terms of all these different maternal mortality ratios. Under 5 mortality ratio education that people are getting and so on.
This brings us to the topic of poverty, when we have an income inequality then in the same state or in the same society we will have certain people with more income, certain people with less income certain people with more wealth certain people with less amount of wealth. That brings us to the definition of poverty.
Poverty is a state or condition in which a person or community lacks the financial resources and essentials for a minimum standard of living. So, poverty is a state or it is a condition in which a person or community. What it means is that we can have poverty at the level of a person or we can also have poverty at the level of a community. Which means that in a community there can be certain people who are rich and certain people who are poor or we can have a community that itself is rich or poor.
We have observed that in the case of different states there are certain states that have more resources. We will say that those are the richer communities and there are certain states with lesser resources and we can say that those are poorer communities.
And poverty will be defined as a state or condition in which a person or community lacks the financial resources and essentials for a minimum standard of living. So, we are not talking about a very luxurious life, but we are saying that the minimum standards of living; how easy it is for people in those communities to meet the minimum standards of living.
In this case we can define 2 different kinds of poverty: absolute poverty and relative poverty. Absolute poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter education and information. So, absolute poverty is characterized by a severe deprivation of basic human needs.
On the other hand relative poverty is a condition where a household income is lower than the median income in the particular country. So, the difference between absolute and relative poverty is that absolute poverty says that people are unable to meet the basic requirements.
Whereas, relative poverty says that even in a community that people are able to meet their basic requirements, there will be some people who have more income and some people who have less income. So, the people who are earning less than the median income would be said to be poor, in terms of relative poverty.
So, a condition where a household's income is lower than the median income in that particular country is the people who fall in the bottom half. We will say that they are the relatively poor people in that community or that country. So, it is possible for a person to be relatively poor, but not absolutely poor.

Because in the case of a person who is relatively poor, but is having access to sufficient amounts of nutrition, sufficient access to health, and a sufficient amount of education, but still there are people in that community that are earning way more. So, in that case we will say that this person is not absolutely poor, but he is relatively poor when compared to others.

At the same time there can also be a situation where everybody is absolutely poor and in that case it is possible for a person to be relatively rich, but absolutely poor. Which means that the community in itself is having such a huge lack of resources that even the best of people are unable to meet the basic human requirements of health education information and so on.

This is the difference between absolute poverty and relative poverty. Absolute poverty talks about a severe deprivation of basic human needs and relative poverty talks about the comparison with other people in that country or community.

Now, absolute poverty depends not only on income, but also on access to social services. Which means that you can have people who have a very small amount of income, but if they are provided the basic human needs of shelter, education, nutrition and so on by say the government or they are provided these amenities by say an NGO then they will cease to remain in absolute poverty.

Even though their income levels are very low, which means that we can eliminate absolute poverty by things such as providing nutrition to people or providing shelter to people or by providing a certain amount of money to these people.

So, absolute poverty depends not only on income, but also on access to social services. In our country absolute poverty refers to per capita consumption expenditure level, which does not meet the average per capita daily requirement of 2400 calories in rural areas and 2100 calories in urban areas along with a minimum of non food expenditures.

Which means that in our country we say that a person is absolutely poor, when he or she is not able to meet the minimum nutritional requirements and certain other requirements. We would also mean that if the government provides everybody with minimum nutritional requirements, that is the government provides food grains at cheaper cost, then we can pull people above the poverty line.

That means, we can bring them away from absolute poverty. This is why these two definitions become important. And in this context we define the poverty line, it is an absolute level of income set by the government for each family size below which a family is deemed to be in poverty.

It is an absolute level of income, which means that we are talking about absolute poverty, we are not talking about relative poverty. The poverty line is an absolute level of income that is set by the government, for each family size because if somebody has a larger family then probably they will require more income. And if the income of the family is less than this absolute level that is set by the government for that family size, then we will say that this family is below the poverty line.

And in this context we also define the poverty rate or the head count ratio, poverty rate is the percentage of the population whose family income falls below an absolute level called the poverty line. That is when we are talking about the poverty rate we are asking the question of all the families in our country or in a state. What is the percentage of families that are below the poverty line? That is they are below this minimum criterion or the minimum level that has been set by the government.

More the number of families that are below the poverty line more will be the poverty rate also known as the head count ratio. And in our country if we look at the head count ratio it has been decreasing over time.

In 1973-74 around 50 percent of people in urban areas and even more so the number of people in the rural areas were below the poverty line. But in the year 1999- 2000 this figure had come down to less than 30 percent.

So, the poverty rate was roughly half in a quarter of a century. This is the head count ratio, the percentage of families that are below the poverty line and with time because of development more and more people are now moving out of the poverty line.

But if you look at the number of poor in millions, then it presents a somewhat different picture. If you look at the number of rural poor then we will find that this number has been going down. But if you look at the number of urban poor we will find that this number went up and now it is showing a downward trend.

Now, why do we see this increase in number, now this increase in number can be because of 2 reasons: one is that these people are not running enough, that is the incomes of certain groups of people are becoming less. So, that they are moving from above the poverty line to below the poverty line, now that can be one reason.

But another reason that is more prominent in our country is that because of migration people move from rural areas to the urban areas and in a large number of cases the people who shift from rural areas into urban areas are the poor people, who are looking for casual employment.

Say employment: in employment as a street seller or employment as a household worker or employment as a casual labour in a factory, employment as a porter. Now, these people who were extremely desperate who were extremely poor were living in the rural areas and they shifted to the urban areas in search of employment.

In such a scenario the number of urban poors would increase because more and more rural poor are moving into the urban areas. But the good thing is that the poverty rate has been going down with time.

When we are talking about poverty it is important to remember that people can move into and out of the poverty line, that is there can be times where people are more poor and there can be times where the people are less poor. A good example is the agricultural sector.

In the agricultural season more and more people get employment in the fields. When they get work they get a certain amount of money, but at the end of the agricultural season when there is no longer any need for the workers or there is very little need for workers in those times these people lose their jobs and in that case they become poorer.

So, we have certain categories of poverty, the first category is always poor. If this is the poverty line that is on the y axis we have the income on the x axis we have the time and if this is the poverty line and if the income of a family or a household is it is going up and down with time. But at all points of time it is below the poverty line then we will say that these people are always

poor.
On the other hand we can have situations where people are usually poor, which means that for a large portion of the time they are below the poverty line. But there can be instances where they move above the poverty line. In this case they are usually poor, they are not always poor.
Then the third category is that of churning poor. So, these are those households that are regularly moving in and out of the poverty line. For certain periods of time they are below the poverty line and for certain periods of time they are above the poverty line. This is known as churning poor.
On the other hand we can also occasionally have poor people, which means that for the most part they are above the poverty line. But in certain points they move below the poverty line. And then we have the category of never poor of those people who are always above the poverty line.
It is important to note here that poverty is a dynamic phenomenon that can change with time. So, a person who is absolutely poor can become a non poor in certain seasons when they are getting employment or probably when they get remuneration by selling agricultural produce.
There could be certain points of time where these people are no longer poor, but then there are the people who are not poor they can also move into the poverty line. So, this is a dynamic concept.
The next thing to note is that the income distribution and poverty rate do not completely quantify the inequality. Now in this case we are interested in conservation economics to know the situations or the circumstances where poverty would lead to a greater environmental degradation.
What we have seen so far is that when people are poor then the amount of pressure that each household puts on the environment in certain cases is much greater than if these people are moved out of the poverty line.
But then this is not the complete story. Basically we can say that people who are very rich are also putting a very large amount of strain, people who are very poor are also putting a very large amount of strain. But then the people in between are putting probably a lesser amount of strain on the environment. How can we make those people who are very poor a little less poor? Is income the only criterion? The answer is no, because what matters is not the income but the ability to maintain a good standard of living.
Essentially if there is a household that is earning less, but we are able to provide it with education and health services, adequate nutrition then probably we would be able to shift them from the very early stages of demographic transition probably to a later stage, that is we are interested in making these people a little less poor by providing them with all different sorts of facilities that are necessary for the maintenance of the minimum basic standards of living so that the amount of pressure that this household is putting on the environment reduces, that is probably we we increase their living standards to such an extent that it is now possible for them to say purchase fertilizers. So, their crop productivity increases and the amount of pressure that they are putting on the forest reduces.
Because they now no longer require very large portions of land, because of the productivity increases or with adequate amounts of health services and education. We can make them come to the conclusion that yes our children are going to survive. It is not the case that the majority of our children are going to die, which means that even if we have 1 child or 2 children they are going

to reach adulthood.
Now, there is no longer a need to have a larger family. So, if that is our aim to use the concepts of poverty to aid conservation, then how do we analyse this situation is providing income the only way out the answer is no. So, what matters is not the income, but the ability to maintain a good standard of living and this ability is also affected by things such as in kind transfers.
In kind transfer is transfers to the poor given in the form of goods and services rather than cash, which means that in place of giving the poor people with money directly to purchase food at the normal market prices.
What the government does is that it provides them with a certain amount of rations every month either free of cost or at a very nominal rate and when the government does that it is able to raise their nutritional level of standards.
Similarly, the poor people get access to health facilities. So, even though they might not be able to afford a private doctor in say a city, the government ensures that there is a hospital that is set up in their community and also that doctors are appointed there so that the poor people are also able to get access to good health services.
Similarly, the government puts a lot of emphasis on opening up educational institutions, primary schools in areas that are more poor and more backward. The government puts a lot of emphasis on setting up things such as clean sanitation or provisioning of clean water in areas that are very poor.
In this case the government is not providing money to the people, but the government is providing them with facilities in the form of in kind transports and those are also able to raise the standards of living. So, when we saw here that the head count ratio has been going down, a major factor is also because in our country the poverty line is defined by the amount of nutrition that people get 2400 calories in rural areas and 2100 calories in urban areas.
But with the government programs and policies we have been able to provide people with this amount of rations, so that they are able to get this amount of nutrition. Another thing is the economic life cycle, the regular pattern of income variation over a person's life. So, we observed here that there is a regular pattern of variation in income.
In certain points of time people have more money, in certain points of time they have less money and a very important thing in this case is retirement. Now, people earn money when they are in the employable age, but when people become old then they do not find employment. So, in that case their income reduces by a very drastic amount. Because of that, retirement planning is important.
So, the income is less to begin with, then it rises with age and sharply reduces on retirement, if retirement planning is done properly a decrease in income will not reflect as a decrease in the living standards. And this is what the government is also emphasizing these days. So, the government has brought up a number of programs that provide people with facilities for better retirement planning things like old age pensions.
Another point is the permanent versus transitionary income, so a person's normal income versus the income in a particular time period, such as drought or flood or market upheaval. The standard of living is more dependent on the permanent or average income while transitionary changes can

be smoother now using loans etcetera.
When we talk about this permanent versus transitionary income, we are interested in this portion. So, there are certain people who are occasionally poor, that is for a large portion of the time they are above the poverty line, but because of certain market fluctuations or things such as drought they might move into the poverty line.
When a person moves from above a poverty line situation into the poverty line, then it is also possible that their living standards do not go down drastically. Why because they have access to funds in the form of things like loans. So, in this case the average income of a person is more important than transitionary income.
Even if transitionary income goes down, if we are able to ensure that people have a good amount of average income, then that will be helpful to the people. Now, next we come to the normative question should income be redistributed. So, when we talk about poverty although one way of reducing poverty is by taking the money from the rich people and giving it to the poor people, the question is should the government do it. Now, this is not just a question of economics it is also a question of philosophy and a question of quality.
And in this case we have several schools of thought, the first school of thought is utilitarianism, it is the political philosophy. According to which the government should choose policies to maximize the total utility of everyone in the society, where utility is defined as a measure of happiness or satisfaction.
So, utilitarianism says that the aim of the government should be to keep the maximum number of people happy or satisfied. Now, in this case because we have the law of diminishing marginal utility it means that a person who is having a large amount of income is probably gaining a lesser amount of happiness or satisfaction with each increase in the income.
But in other words what we are saying is that if there is a person who is earning say 100000 rupees or 1 lakh rupees and if the person shifts to earning 101000 rupees now this is case 1. The second case is a person who is earning say 200 rupees and he is also earning 1000 rupees more so 1200 rupees so this is case 2.
In this case what happens is that a person who is already earning a large amount of money 100000 of rupees in for this person this change of 1000 rupees it will not lead to a very large increase in happiness, because percentage wise this change is very less and also the resources or the utilities that this person wants to have in his life they have mostly been already accumulated.
So, this 1000 rupees will not make a very big change in the life of this person. But if you look at case 2 a person who was earning just 200 rupees you give him 1000 rupees and he is now earning 1200 rupees.
In this case there is a 6 fold change in the income. So, even though the absolute change is only 1000 rupees in both the cases, in the first case the change is very minuscule around 1 percent; whereas, in the 2 nd case it is as high as 6 times. So, utilitarianism would say that there is a case of taking money from the rich people and giving it to the poor people. So, in total the amount of happiness or satisfaction in the society increases.
Because of the law of diminishing marginal utility the utilitarian perspective would say that income redistribution will help maximize the utility of the society. So, this is one school of

thought. Another school of thought is Liberalism, the political philosophy according to which the government should choose policies deemed as just.

So, the government should make those policies that are just policies as evaluated by an impartial observer behind a wheel of ignorance. What liberalism says is that the government should be interested in making just policies that are fair policies and fair policies that are judged by an outsider. An impartial person who is behind a wheel of ignorance, which means that this person should not know whether he himself belongs to a rich class or a poor class.

Suppose a person is given this option that he can be born into a rich family or he can be born into a poor family, but he does not know whether he will be born into a rich family or a poor family. Now if you ask this person to make the laws or the policies then probably those will be the best policies, because this person would take care of the interest of both the rich as well as the poor. So, these will be fair policies.

Because he might be born as a rich person in which case if he had made policies to favour only the poor then he will be negatively influenced. On the other hand he may even be born a poor person. So, if he had made policies that favour the rich in that case he would be negatively impacted.

So, given that a person does not know whether he will be born rich or poor and if you ask such a person to bring the policies, those will be the most fair policies. So, this is what liberalism says and it talks about the maximin criterion or maximizing the minimum utility.

So, the people who have the minimum utility and the fair policies would try to maximize their utility, the claim that the government should aim to maximize the wellbeing of the worst off people in the society. So, in the case of liberalism it says that the government should try to help the most poor people and while this criterion suggests income redistribution. So, some amount of income redistribution is ok according to liberalism.

The veil of ignorance would suggest that complete equality would remove the motivation to work to the detriment of the society. So, liberalism says that yes some amount of income redistribution should be done, but it should not be done to equalize everybody, because if everybody is equal then there will be no incentive for people to become rich to work hard and we want people to work hard so that the society progresses.

And so there has to be some amount of inequality, but then this inequality should be maintained in such a manner that the poorest people also are not very bad often, that is they also have abilities to meet the minimum standards. So, this is liberalism.

It suggests that some income redistribution should be done, but some inequality should remain to motivate people to work and redistribution of income should be done in the form of social insurance. So, the worst of people are also protected.

Social insurance is the government policy that is aimed at protecting people against the risk of adverse events. Social insurance is a government policy aimed at protecting people against the risk of adverse events. It means that when we make the policies, then liberalism would say that if somebody becomes very poor if there is, say, a drought, then there should be policies that help these people.

Another school of thought is libertarianism, the political philosophy according to which the government should punish crimes and enforce voluntary agreements, but not redistribute them. So, this is another extreme. It says that the role of the government is to punish crimes and enforce the voluntary agreements, but not to redistribute income.

Equality of opportunity is more important than equality of incomes and once the rules of the games are established the government should not alter the result. So, libertarianism says that the government should only be interested in making the institutions - maintaining the institutions that promote the rule of law.

But once you have the system then a person should be allowed to remain in whatever state he or she is in. So, if somebody is poor even though the system is just, if somebody is poor the government should not help that person. This is another school of thought.

What we are observing here is that when we talk about income redistribution we can move from utilitarianism which says that everybody should be made equal to maximize utility to the other extreme which is libertarianism which says that even if somebody is poor we should let that person remain poor. So, this is a normative question.

Now, because the government is interested in reducing poverty in our country we are more towards liberalism than either of the 2 extremes, so we take the middle path. So, the government tries to reduce poverty and the government reduces poverty or it tries to reduce poverty by a number of measures such as the minimum wage loss.

It says that people have to be paid a minimum amount, but as we have seen in a number of cases it results in surplus. Apart from minimum wage laws we have welfare policies which are government programs that supplement the income of the needy, such as things like old age pensions or disability pensions. So, people who are very old or people who are disabled they are provided with a certain amount of government money to supplement their incomes because they are needy.

We also have negative income tax which is a tax system that collects revenue from high income households and gives subsidies to the low income households. So, in our country as well we have income tax that is a progressive tax which means that if somebody is earning more than a larger share of income is taken from that person.

But at the same time the government also provides subsidies to the poor people. So, negative income tax is also used in kind transfers are used such as provisioning of food grains at subsidised prices and we also have anti poverty programs and work incentives such as the Mahatma Gandhi National Rural Employment Guarantee Scheme, but to bring the income inequality to 0 or not still remains a political question.

That is all for today. Thank you for your attention. Jai Hind!