Conservation Economics

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Module 7
Markets, Welfare and Conservation
Lecture 1
Surplus and market efficiency

Namaste! Today, we begin a new module which is Markets, Welfare and Conservation. This module will have 3 lectures - surplus, market efficiency and the cost of taxation and international trade. So, let us begin with Surplus. Well, we have seen in the principles of economics that trade can make everyone better off and also that markets are a good way to organize economic activity. Now, the question is why does trade make everyone better off and why is the market the best way to organize economic activity?

Well, one major thing that happens in the case of a market is that there is nobody to tell a person what is good for him or her. Essentially a buyer does what he or she perceives to be in the best interest of himself or herself. Similarly, when the seller decides to sell a particular good at a particular price he or she is selling that good at that particular price because he or she feels or perceives that selling the good at that particular price is going to be beneficial to him or her.

Essentially in the case of a market everybody is trying to maximize his or her welfare or his or her profits because of which markets become very important tools to organize the economic activity. Because in this case there is no third person to dictate to a person that he or she should be buying such stuff at such price or he or she should be selling such stuff at such price. Because making this decision for the whole of the economy is going to be extremely difficult.

But when you permit people to make these decisions by themselves by perceiving what is in their own best interest and remember that a person is in the best position to determine what is good for him or her or what is best for him or her. Now, in the case of a market because everything is everybody is trying to maximize his or her benefits.

Everybody is trying to work in their own best interest so, in that case if we permit a market to work by itself then there would be a maximization of the self interest of everybody which is why markets become extremely important tools. Not only for the working of the economy, but also for the working of the society because in the case of a market the well being is maximized for the maximum number of people. But, the question is how do people decide what is best for them.

What are the things that are going on in their mind when they decide to, say, when a buyer decides that I am going to purchase this pen for say 20 rupees, the question is what is going on in my mind that I should purchase it for 20 rupees? Why not 21 rupees? Why not 22 rupees? Why not 30 rupees?

How do I get to this value of 20 rupees for this pen and similarly, when a seller decides that he or she is going to sell this pen for 20 rupees, the question is why does he or she not sell it for 15 rupees and also why does he or she not sell it for say 30 rupees? What brings us to this golden price value of 20 rupees?

That is the question that we are going to dissect in this particular lecture that is surplus. So, in short the buyer is trying to maximize his or her own surplus or welfare and similarly the seller is trying to maximize his or her own surplus or the welfare. Now, the thing is how we reach this value of surplus and how we can make use of this quality of surplus or welfare to reach our demand and the supply curves, is what we are going to see in this particular lecture.

Why does a buyer purchase anything different goods have different values for buyers. Now, what is value? A value is the importance of something. So, there is a value of most of the things in the eyes of most of the people, but then this value is going to differ from person to person. If I am interested in writing, say if I am a student or I am a teacher or I am a bureaucrat, then I have a utility for a pen. So, I have a value for a particular pen.

But, it is possible that there is a person who is completely illiterate and does not know the value of writing, he does not know how to write. Now, in that case a pen would hardly have a value for this person. Similarly, if I am hungry I will put a greater value on food than when I am not hungry. So, value depends on the buyer; value depends on his or her status; it depends on his or her academic abilities; it depends on his or her needs.

And, because needs change with time whether a person is hungry or not, whether a person has just run out of a pen before signing say a very important document or somebody has run out of a pen just before an examination, then that person will put a greater value to a pen as compared to another person who say has 10 pens with him.

So, value varies from person to person and value is what decides how much am I going to pay for any particular good. So, different goods have different values for buyers and these goods are available at different prices which means that suppose, I have a value for a pen and I say I think that this pen is going to provide me a benefit which is say equal to 50 rupees. Now, in the market if I go and purchase a pen I will find pens at different prices.

So, there can be a pen for 5 rupees, there can be a pen for 5,000 or say even 50,000 rupees. Now, the value that I am putting to the pen at this particular juncture is 50 rupees. So, that would help me determine which pen I should go for. Now, suppose I am only going to use a pen for normal writing.

And it is not going to have a sentimental value for me, so, in that case probably I will go for a 10 or 20 rupee pen. But, suppose I am gifting a pen to somebody who is very important and I am attaching a sentimental value to this pen, I would want that person to hold this pen dearly for say a number of years. Now in that case the value that I will put on the pen will be much greater. I will probably go for a pen that is a very luxurious pen or probably that is gold plated because I am attaching a value to that pen so that it remains with the person for a very long period of time. Now, if I have set a thought that I should be using or I should be gifting a pen which is gold plated in that case I might even go for a pen that is say 2000, 3000 or 10000 rupees price. So, the value and the prices can help a buyer determine which particular good he or she should go for.

So, different goods have different values for buyers and these goods are available at different prices.

Now, if the value of a good is greater than it is price, the buyer may purchase the good and enhance his or her surplus meaning that currently if I am out of pens and I am putting a value for a pen at 50 rupees and suppose, I go to the market and I get a pen of my liking for say 20 rupees. Now, in that case the value that I was putting to the pen was 50 rupees, the price is 20 rupees. So, essentially in my mind I will think that ok I am at a profit and this is the profit of 30 rupees.

Now, mind you, I am not getting these 30 rupees, but it is just that I am thinking that something that has a value of 50 rupees I am able to get for 20 rupees. It is very similar to when we decide which particular vehicle to get or say which plot to buy or which house to buy.

Now, suppose I look at different houses and I figure out that ok, this house has a valuation of say 70 lakhs of rupees and if this house is available in the market for 50 lakhs of rupees. Then it might go on in my mind that ok, the value is 70 lakhs, I am able to get it for 40 lakhs. So, there is a difference of 30 lakhs between the price and the value. I may hold this house and probably I might sell it at a later point of time for 70 lakhs of rupees.

Now, in this case when I purchase the house I am not getting that 30 lakhs of rupees, but I am happy because I am thinking that I am getting something that has a value of 70 lakhs and I am only getting it for 40 lakhs of rupees. Now, similarly, in the case of any good or service that we are purchasing, so, if the value of the good is 50 rupees, the price is 20 rupees then in the mind of the buyer there will be a thought that I am getting this thing of a higher value at a lower price and this difference is known as surplus.

Consumer surplus is the amount a buyer is willing to pay for a good minus the amount the buyer actually pays for it, meaning that suppose I was willing to pay 50 rupees for a particular pen, but I got it for just 20 rupees. In that case the difference between 50 rupees and 20 rupees is the consumer surplus that I am getting.

The amount a buyer is willing to pay for a good and what is the amount that a buyer will be willing to pay for a good, it will be equal to the valuation of that particular good in the mind of the buyer. If I perceive that this pen is having a value of 50 rupees, so, 50 rupees is the maximum that I am going to pay for it.

I am willing to pay 50 rupees for it because that is the value of this good in my mind, but it is available for just 20 rupees. So, the difference between the amount a buyer is willing to pay for the good and the amount the buyer actually pays for it, is the consumer surplus.

This is related to the concept of willingness to pay the maximum amount that a buyer will pay for a good and this is an indication of the value of the good to the buyer. Now, what we are saying here is, if I perceive that this pen has a value of 50 rupees will I pay 60 rupees for it? Probably not. Why? Because the value is 50 rupees, so, why should I be paying 60 rupees? Will I be paying 51 rupees? Probably not because here again the price is more than the value.

But, if the price is also 50 rupees and my value is also 50 rupees, so, in that case I might pay for it. Now, here again the thing is I might pay for it because my surplus remains the same whether I purchase this good or not.

Or to put it in other words, suppose I have rupees 500 with me and if I use it to buy this pen for

50 rupees then I am only left with 450 rupees because I have spent these 50 rupees to buy this pen. But, earlier the total value that was with me was 500 rupees and now, also the total value is 500 rupees. So, in that case I will be ready to purchase this pen. But, what happens if I am able to get this pen for a lot less? So, the point is in place of 50 rupees. Suppose I am able to get this pen for 20 rupees.

In place of 50, this is 20 rupees. So, I am left with 480 rupees. So, what is the total value that is with me now? So, it is 480 rupees plus 50 rupees because 50 rupees is the value of the pen that I am putting. So, the total value with me is now 530 rupees. So, I began with a value of only 500 rupees.

This is the initial value, but after the transaction I have 530 rupees. So, essentially with this transaction I am able to increase the total value that remains with me and if economics says that every buyer is trying to maximize his or her own assets. So, earlier the asset was only 500 rupees, but now the asset is 480 rupees plus this pen and in my mind the value of this pen is 50 rupees. So, the total asset with me now is 480 plus 50 which is 530 rupees.

Before the transaction I was having 500 rupees, now I am having assets worth 530 rupees. So, I will go for this transaction. So, the willingness to pay is an indication of the value of the good for the buyer and a buyer is only willing to pay to that level which is equal to the value of the good. If the price goes even a single paise above the value of the good, the buyer will not purchase that good. So, the willingness to pay is a very good indication of the value of the good in the eyes of the buyer.

Now, we can look at it with an example. Suppose, there is a cake that is available in the market and we have 5 potential buyers and these buyers are having different values for this cake probably because they are having different levels of hunger. So, we have a person named Ram, who is very hungry and he is very fond of cakes. So, he puts a value of the cake to be 100 rupees which means that the willingness would be that he would not pay above 100 rupees.

Well, if the price of the cake is 101 rupee and the value is 100 rupees, then why would Ram have this cake? It would decrease the total assets that he would be having. So, in this case the value of the cake 100 rupees tells that Ram is not going to pay above 100 rupees.

Shyam has a value of 80 rupees. So, he will not pay above 80 rupees. Sita puts a value of 70 rupees. So, she will not pay about 70 rupees. Similarly, Gita is putting a value of 30 rupees which means that in the eyes of Gita she should only be willing to pay less than or equal to 30 rupees which is she would not pay above 30 rupees.

Meera is putting a value of 20 rupees. Now, in this example what we are observing is that it is the same cake, but then different people are putting different values to that cake, depending on what they are fond of or what is their current state if they are hungry or not. Now, if there is somebody who is averse to, say, sweet things it is possible that in this case Meera only likes salty items which is why she is not putting a high value on this cake.

Or probably Meera just finished off with her lunch and she is feeling completely satiated. Now, because of this satiety she is not feeling any more hunger. So, she does not want to eat anything. So, in that case the value of the cake would be lesser in the eyes of Meera as compared to the value of the cake in the eyes of Ram.

Now, this value can also help us determine what will be the demand scheduled. So, suppose this cake is available for more than 100 rupees, probably this cake has a price of 110 rupees. Now, in this case will any of these persons be willing to pay for this particular cake? So, the price is rupees 110. Now, will Ram pay for it? Will Ram, seeing that the value of the cake is 100 rupees, will he be paying 110 rupees? The answer is no. What about Shyam, Sita, Gita and Meera?

They also put the value of the cake to be less than 110 rupees. So, in this case none of these people are going to purchase the cake which means that if the price is more than 100, then the number of buyers who are willing to pay the price for the cake are 0. So, the quantity demanded is 0.

So, at the price of greater than 100, the quantity demanded is 0. What about if the price is between 80 and 100 rupees? Now, suppose the price is 90 rupees. Now, at 90 rupees, who is going to buy this cake? Now, Ram puts a value of 100 rupees to this particular cake. Now, if the value of the cake in the eyes of Ram is 100 rupees and this cake is available for just 90 rupees, then probably Ram is going to purchase this cake because if he purchases this cake.

Then he is adding 10 rupees to the total assets that he has; which means that the amount of money that he will have will be less by 90 rupees because he is paying 90 rupees for the cake, but he is getting a cake that is worth 100 rupees in his eyes. So, in that case if he purchases this cake then the total assets of Ram will increase. So, in that case if the price is 90 rupees, then probably Ram is going to purchase this cake. So, at any price between 80 and 100 rupees because 80 rupees is the value that Shyam is putting.

So, if it is anything that is more than 80, say 80 rupees and 1 paise to 100 rupees then we will have only Ram who is willing to pay the price for the cake and so, the quantity demanded in this case becomes 1. For a price between 70 and 80 rupees, say the price is 75 rupees. Now, at 75 rupees Sita will not want to buy this cake.

Why? Because the value in the eyes of Sita is just 70 rupees, so, why should she pay 75 rupees? Similarly, Gita will not purchase the cake for 75 rupees. Gita will also not purchase, but Shyam will think that ok the value of the cake in my eyes is 80 rupees, it is available for 75 rupees. So, if I purchase this cake for 75 rupees I will add 5 rupees to the total assets that I have. Now, remember that in the case of economics we think that everybody is a rational thinker.

So, everybody is making rational decisions to maximize his or her own assets or in other words his or her own welfare. Now, in this case Shyam will think that if I purchase this cake I will add 5 rupees to my assets because just by paying 75 rupees I am getting something that is worth 80 rupees.

So, for any price between 70 and 80 rupees we will have Ram and Shyam who are ready to buy. So, between a price of 70 to 80 rupees we have Ram and Shyam who are willing to pay the price for the cake and so, the quantity demanded becomes 2. Similarly, at a price between 30 and 70 rupees between 30 and 70.

We will have that the price is less than the value that Ram, Shyam or Sita put to it. So, for a value between 30 and 70 Ram, Shyam and Sita will be willing to pay the price for the cake and so, the quantitative demanded becomes 3. Between a price of 20 and 30 rupees we will have 4 people who will be ready to pay the price and so, the quantity demanded becomes 4. And, for a

price that is less than 20 rupees all 5 of them would want to pay for it.

So, they will be willing to pay the price for the cake and so, the quantity demanded becomes 5. So, in this way we can convert the valuation of different buyers into the demand schedule. Now, the demand schedule is the table that tells us what is the quantity demanded at each price. Now, in this case we are observing that when the price goes down, the number of buyers or the potential buyers increases.

And, we can convert this into a demand curve if we plot it. So, here we were observing that above 100 rupees the quantity demanded is 0. So, if the price of the cake becomes more than 100, then the quantity demanded becomes 0. So, which is why we are getting a line, this vertical line here.

Between a price of 80 to 100 rupees you have quantity demanded is equal to 1. So, between 80 to 100 rupees you have only 1 quantity that is demanded. So, which is why we are getting this section. Now, of course, we join both of these together to make it a complete graph. So, between so, if you have more than 100 rupees it is 0 between 80 to 100 it is 1. Then from 70 to 80 it becomes 2. So, 70 to 80; so, this is 70, this is 80. So, between 70 to 80 you have the quantity demanded is equal to 2.

So, we are reaching this point. So, this is the price point of 70. So, here we have 70 and this point is 80 here. So, between 70 and 80 we have a quantity demanded that is 2, then from 30 to 70 it is 3. So, from 30, so, 30 is this point this is 30. So, between 30 and 70 we have a quantity that is 3, between 20 and 30 it is 4.

So, from 20 to 34 are demanded and less than 20 we have a quantity demanded of 5. So, if it becomes less than 20, then there is a demand of 5. So, this is bringing us to the demand curve. So, let us remove these lines now. So, this is now the demand curve that we are observing here.

Now, you will observe here that as the price reduces, the quantity demanded increases which is the law of demand; with a decrease in price there is an increase in the quantity demanded. And, we are observing that this demand curve is coming from the valuation that different people are putting and when the price becomes very less, then the price becomes lucrative for all those people who were putting a valuation above that price. So, the quantity demanded increases.

But, when the price increases then it might reach a level where there are a number of potential buyers who are now thinking that the price is too high and so, they will not demand the good at that particular price. So, as price increases the quantity demanded decreases which is what we are observing in this curve.

Now, with this curve we can start to talk about the consumer surplus which is there at different prices. Now, what is consumer surplus consumer surplus is the difference between the value of the good and the price that a person is willing to pay for it. So, at different price points we can compute the consumer surplus.

Suppose we talk about the price point of 90 rupees. Now, at a price point of 90 rupees there is only one person who is demanding the good which is Ram. Now, Ram has put a value of 100 rupees for the cake and the value is 100 rupees, it is available for 90 rupees. So, what is the consumer surplus for Ram?

It is the value that he had put which is 100 rupees minus the price that he gets to be in the market

which is 90 rupees. So, what we are observing here is that the value of cake for Ram is rupees 100 the price at which cake is available is rupees 90 and so, the consumer surplus for Ram is 100 minus 90 is 10 rupees.

So, here we are observing that for at the price point of 90 rupees Ram's consumer surplus is 10 rupees. Now, if the price lowers, suppose in the market this cake is available for 80 rupees. In that case Ram's consumer surplus will be 100 minus 80 is 20 rupees.

If the price goes down even further at a price point of 70 rupees Ram's consumer surplus will be given by the value that he had put 100 rupees minus 70 rupees is 30 rupees. But, at the price point of 70 rupees we also start to observe Shyam's consumer surplus.

So, Shyam's consumer surplus because he had put a value of the cake to be 80 rupees and it is available for 70 rupees, so, Shyam's consumer surplus is this difference 80 minus 70 which is 10 rupees and in that case the total consumer surplus will be given by Ram's consumer surplus and Shyam's consumer surplus is 30 plus 10 is 40 rupees.

Now, remember that in the case of a market everybody is a price taker which means that they are not able to influence the prices, neither Ram can influence the price nor Shyam can influence the price. So, we are not talking about haggling or bargaining in the market.

So, the price is fixed and at this price point, any buyer can purchase any number of items that are there in the market. So, at the price point of 70 rupees Ram can also purchase a cake and Shyam can also purchase a cake because of which we are adding both of these consumer surpluses to get the total consumer surplus. Because at 70 rupees Ram will get a consumer surplus of 30 rupees if he buys the cake, Shyam will get a consumer surplus of 10 rupees if he buys a cake.

And, both are able to buy a cake in this market because the number of goods is not limited and so, the total consumer surplus will come to be 40 rupees. If the price goes down even further; so, say at a price point of 30 rupees we will have Ram's consumer surplus which is given by this area which is the difference between 100 rupees which was his valuation and the price of 30 rupees. So, Ram's consumer surplus here is 70 rupees; Shyam's consumer surplus is 80 minus 30 is 50 rupees.

Sita's consumer surplus is 70 minus 30 is 40 rupees. So, at the price point of 30 rupees, now three people are demanding the goods and all three of them are having different consumer surpluses and the total surplus is given by 70 plus 50 plus 40 is 160 rupees. If the price goes down even further, say at 20 rupees.

Now 4 people are having consumer surpluses. So, Ram's consumer surplus is 100 minus 20 is 80, Shyam's is 80 minus 20 is 60; Sita's is 70 minus 20 it is 50 and Gita's is 30 minus 20 which is 10 rupees and the total surplus is given by 80 plus 60 plus 50 plus 10 which is 200 rupees.

So, now, the total consumer surplus is 200 rupees. When the price goes down even further, say at a price point of 0 rupees, we will have a consumer surplus by all five of the potential buyers. So, Ram's consumer surplus will be 100 minus 0 is 100 rupees; Shyam's consumer surplus is 80 minus 0 is 80 rupees; Sita's is 70 minus 0 is 70 rupees; Gita's is 30 minus 0 is 30 rupees and Meera's is 20 minus 0 is 20 rupees. And, the total consumer surplus is the sum of all of these.

So, 100 plus 80 plus 70 plus 30 plus 20 is 300 rupees. So, what we are observing here is that the total consumer surplus is the area between the demand curve and the price. So, the price is fixed

and the area between the demand curve and the price is giving us the consumer surplus.

Now, in the case of a market there are not just 5 sellers there are n number of sellers. And, in the case of a very large number of buyers and sellers which is our theoretical construct of a competitive market, what happens is that because we have an infinite number of buyers and each buyer is putting a different value to the good. So, these steps will become even finer. And, so, ultimately we will get to a curve that is just a straight line.

So, what is happening in this case is that when the number of buyers is less we are observing this sort of a demand curve. When the number of buyers increases in the market we will start observing a curve like this. Then when the number of buyers increases even further, we will start to observe an even finer curve say something like this. So, as the number of buyers is increasing the demand curve is becoming more and more finer and ultimately when the number of buyers is too high.

It is close to infinity then we will observe just a straight line. So, the straight line that we are so accustomed to watching in terms of the demand curve is actually this demand schedule of a very large number of buyers seen together. So, because of that it has become So, fine that it now looks like a straight line. So, now, the demand curve is looking like a straight line. Now, what happens for such a demand curve is that, if we can consider a consumer or a potential buyer at this price point.

So, this is the price that he is willing to pay and this is the price that he is actually getting in the market. So, the difference between both of these is his consumer surplus for this buyer. Similarly, for this buyer we will have a consumer surplus which is equal to this amount.

And if we look at all of these potential buyers we will find that the total consumer surplus is this area that is shown in yellow. So, the total consumer surplus is the area between the demand curve and the price which is the area below the demand curve till you reach the price at which this particular good is available in the market.

Another key takeaway is that with lower prices, we can raise the consumer surplus because here we have observed that; when the prices are high then the total consumer surplus is less. When the price goes down the total consumer surplus increases because the total consumer surplus is this area between the demand curve and the price point.

So, if you bring the price lower, then you will add to the area that is there in the consumer surplus. So, at this price point we have this area in blue that is the consumer surplus because it is the area between the demand curve and the price. At a lower price point we have a larger area which is given by this.

All of this is now a part of the consumer surplus. So, it includes this area that was there earlier plus this area that is there in green. So, at a lower price point the consumer surplus increases. If you reduce the price even further the consumer surplus will increase even further and at a price point of 0 rupees the all the area that is below the demand curve will become the consumer surplus. So, these are the 2 key takeaways: one, total consumer surplus is the area between the demand curve and the price and; two - lower prices raise the consumer surplus. Now it is important to note here that the consumer surplus measures the benefits to the buyers as they themselves perceive it, that is nobody is telling the buyer that this is your consumer surplus.

But, what is happening is that every buyer is putting a different value to the same good, probably because they are in a different profession, probably because they are in a different state, probably because there is a different level of emergency to all of these people. A person who is extremely hungry will be in a more emergent requirement of food than say a person who just had his meal. So, different people are putting different values.

So, they are perceiving different values and the difference between their values and the price is giving us the consumer surplus. So, it is the measure of the benefits to the buyers as they themselves perceive it. There is nobody from outside who is telling them that this is the benefit that they have, the benefit that they are perceiving is the consumer surplus.

Now, another question that we can ask in the market is why does the seller sell? Now, a buyer was buying things because he was increasing his assets because he was giving less amount of money and he was getting something that was worth more in his eyes. So, which is why, a buyer was buying a good.

Now, the question is why does the seller sell the goods? Now, in the case of a free market, everybody's working for his or her own welfare which means that when the seller is selling the goods probably the seller is also increasing his or her own assets. So, when the seller is selling this pen for 20 rupees, then probably he was able to make this pen for 15 rupees So, that he is able to get a profit of 5 rupees. It is only then that the seller would be willing to sell in this particular market.

Now, in a market, different goods have different costs for sellers. Now, why should any goods have different costs for different sellers and why should different goods have different costs? Well, one primary thing that determines the cost to the sellers is the cost that it takes to manufacture the product that is not just the cost of the raw materials.

And the cost of labor or the cost of running the machines, but also the cost of transportation. Now, there are certain items that are simple to construct or simple to make such as things like potatoes. Now, in the case of potatoes the price is less because the cost of production is less.

On the other hand, if we talk about an expensive item such as a mobile phone. So, a mobile phone requires a much greater amount of technology, it requires resources that might not even be available in the country of manufacturing. So, probably it would require certain rare earth metals that are extracted from certain parts of the earth brought to the place where the phone is going to be manufactured and then say processed or integrated into the device to make the mobile phone.

In that case the cost to make the mobile phone will be much greater. At the same time, the same goods can be made by different sellers at different costs because different sellers would be having different efficiencies. A good example is two farmers who are cultivating potatoes, but one farmer is more efficient.

So, he is able to grow more potatoes or more kgs of potatoes per season as compared to the other farmer. So, this brings us to the point that different goods have different costs for the sellers and these goods are sold at different prices. Now, cost is something that is being determined by the product as well as the efficiency of the manufacturer or the seller; whereas, the prices are determined not just by the sellers, but also by the buyers.

To give an example, if there is a particular food fad for say potatoes then the price of potatoes

may go up; on the other hand, if there is a food fad that potatoes are bad for health then the prices may also go down. This would depend not just on the cost of manufacturing or on the sellers, but at the same time it will also depend on the demand for the goods in question. Now, if the price of a good is greater than its cost the seller may sell the good and enhance his or her surplus.

Here there are 2 things that are important, one is the price and the second is the cost. So, there are different costs, there are different prices and if the price is greater than the cost then the seller may sell the goods and enhance his or her surplus or we may even say that it is enough that the seller would enhance his or her own profit or assets.

If this pen can be manufactured for 15 rupees, that is the cost to the seller; if this pen can be sold for 20 rupees, that is the price of the pen. So, if the price is greater than the cost of manufacturing or the cost to the seller, then if the seller is able to sell this pen then he would add 5 rupees to his surplus which is 20 minus 15.

The cost is the value of everything a seller must give up to produce the good and the producer surplus is the amount a seller is paid for the good minus the seller's cost of providing it. So, the amount that the seller is paid for the good is the price minus the seller's cost of providing the good.

To take an example let us say that the cost of producing a cake by 5 different people. In this case Ram is producing a cake for 100 rupees. So, in this case Ram is a seller who is producing a cake for 100 rupees. Now, if it takes him 100 rupees to manufacture the cake, will he sell it for less than 100? The answer is no, because nobody wants to sell something at a loss and in the case of a market we take this assumption that everybody is trying to maximize his or her welfare or surplus.

In this case because the cost to manufacture for Ram is 100 rupees, he will not sell below 100 rupees. In the case of Shyam, his cost of production is 80 rupees so; he will not sell below 80 rupees. Sita is a third manufacturer. Her cost of manufacturing the cake is 70 rupees, so she will not sell below 70 rupees.

In all these cases what we are observing is that we have different sellers who are out there in the market and they have different costs of production and the cost of production gives us the willingness to sell. So, a seller will only sell something if the price in the market is greater than the cost of production; if the price is less than the cost of production then the willingness is not there. We can use this chart of willingness to reach the supply schedule.

If the price of one cake is more than 100 rupees, then say the price of the cake is 110 rupees. Now, at 110 rupees we will find that Ram is willing because he would not sell below 100 rupees, but he will sell above 100 rupees. So, Ram is willing to supply, Shyam is willing to supply.

Sita is willing to supply, Gita is willing to supply and Meera is willing to supply. So, at a price point which is above 100 rupees which is the maximum cost of producing the cake for any of these five sellers we find that all the five sellers are willing to supply the goods. And, so, we will find that at a price of more than 100 rupees the quantity supplied is 5. At a price point between 80 and 100 rupees so, 80 and 100 rupees, so, we are taking a price point in between both of these.

Let us say that the price point that we are considering now is 90 rupees. Now, at a price point of

90 rupees a Ram will not sell because his willingness is not to sell below 100 rupees. So, 90 becomes less than 100, so Ram will not sell. His cost of production is more than 90 rupees, but what about the other 4?

The other four will be willing to supply the cake because their cost of production is less than 90 rupees. So, if any of them sell a cake then they will be earning a profit now in this case we will have these four people Shyam, Sita, Gita and Meera who will be willing to supply.

So, at any price point between 80 and 100 rupees we will have 4 people who are willing to supply and so, the quantity supplied to the market is 4. Similarly, at a price point between 70 and 80 at this price point say 75 rupees you will have only three sellers. So, between 70 to 80 you have only three sellers and the quantity supplied is 3.

At a price point between 30 and 70 you will have only 2 sellers; at a price point between 30 and 20 you will have only one seller and at a price point that is below 20 rupees you will find that none of these sellers is willing to supply. So, if it is less than 20 rupees, then you have the quantity supplied which is 0. Now, this is the supply schedule which is telling us the quantity supplied for the good by at different price points. So, this is the supply schedule.

Now, we can convert this supply schedule into a supply curve. So, this is the supply curve. At a price of less than 20 rupees we have 0 quantity that is supplied; at a price point of 20 to 30 you have only one good that is supplied. So, at a price point between 20 rupees and 30 rupees you have 1 cake that is supplied. We are getting this vertical section from here and then we join both of these to get the curve. At a price point between 30 and 70 rupees 30 to 70 you have quantity supplied is 2.

So, here, the quantity supplied is 2 between a price point of 30 and 70 and so on. So, in the case of the supply curve what we are observing is that if the price is increasing more and more quantities are being supplied to the market which is the law of supply as the price increases the quantity supplied also increases.

What we are observing here is that we can convert the cost of production or the willingness of the chart into a supply schedule because any person will only be willing to supply at greater than the cost of making the goods and from the supply schedule we get to the supply curve. And, we are observing that as the price increases more and more sellers become willing to supply the goods and so, the quantity supplied to the market also increases which is the law of supply.

Now in this example we are having only 5 sellers, but then in a natural market situation and especially in a competitive market we have a very large number of buyers and a very large number of sellers. Now, when the number of sellers is very large then this curve becomes even more finer.

What happens is that currently we are observing a curve that goes like. So, our current curve looks like this. Now, if the number of sellers becomes more then we will start to observe a curve that has a finer scale and, especially if the goods are also sold in much finer quantities.

And, if you have an even larger number of sellers, ultimately you will reach a position where this curve will just become a straight line.

Now, in this supply curve we can compute the producer surplus at different prices, that is if we consider any price point, what is the producer surplus for each of these different producers. Now,

let us consider a price point of say 25 rupees. Now, at 25 rupees Meera's producer surplus is 5 rupees because her cost of production was 20 rupees and the price she is getting in the market is 25. So, her producer surplus is 25 minus 20 is 5 rupees and that is also the total producer surplus. Because the producer surplus of everybody else is 0 rupees because their cost of production is more than 25. Now, at a higher price point of say 30 rupees, Meera's producer surplus is 10 rupees because her cost of production is 20. So, 30 minus 20 is 10 rupees and that is the total producer surplus because here again everybody else is producing at equal to or greater than 30 rupees. If we increase the price even further, say at 70 rupees.

Meera's producer surplus is given by this price minus her cost of production. So, 70 minus 20 is 50 rupees. Gita's producer surplus is 70 minus 30; her cost of production which is now giving a produces surplus of 40 rupees. Sita's producer surplus is 0 rupees because her cost of production is 70 and for others the cost of production is greater than 70. So, in this case what is the total producer surplus? It is 50 plus 40 plus 0 plus 0 plus 0. So, it becomes 90 rupees.

At an even greater price point of say 80 rupees Meera's producer surplus becomes 80 minus 20 is 60; Gita's becomes 80 minus 30 is 50; Sita's producer surplus is 80 minus 70 is 10 rupees; Shyam's is 0 because his cost of production itself is 80 rupees and Ram's is also 0 because his cost of production is greater than 80 rupees. So, he is as good as he is not there in the market. Now, in this case the total producer surplus becomes 60 plus 50, 110 plus 10 is 120 rupees.

If you increase the price even further say at a price point of 100 rupees we find Meera's producer surplus is 100 minus 20 is 80; Gita's is 100 minus 30 is 70; Sita's is 100 minus 70 is 30; Shyam's is 100 minus 80 is 20; Ram's producer surplus is 0 rupees because his cost of production itself is 100.

In this case, the total producer surplus becomes 80 plus 70 plus 30 plus 20 is 200 rupees. And, if the price becomes say 100 and 20 rupees then here you have Meera's producer surplus is 120 minus 20 is 100; Gita's is 120 minus 30 is 90; Sita's is 120 minus 70 is 50; Shyam's is 120 minus 80 is 40 and Ram's is 120 minus 100 is 20 rupees.

Now, we had seen before that if the price goes beyond 100 rupees. Then all 5 stealers are willing to supply the goods into the market and this is what we are observing here. We are having a producer surplus for all five of the sellers and the total producer surplus now has become 300 rupees.

What are the key takeaways from this? 1 - total producer surplus is the area between the supply curve and the price. So, if we consider any of these, this is the supply curve, this is the price and the area that is between both of these, is giving us the producer surplus. Here we were considering only 5 sellers.

If the number of sellers is very large in that case you will find that the supply curve is now tending towards a straight line. And, now the producer surplus is this area that is between the supply curve and the price because for any producer, if this is the price and this is the cost of production then this difference between the price and the cost of production gives us the producer surplus. So, this is the producer surplus for a seller who is at this point.

For a seller who is at say this point, the producer surplus will be given by this amount and so on. So, in total when you have a very large number of sellers, then the producer surplus is this area.

So, this is the first key take away point. The total producer surplus is the area between the supply curve and the price.

The second is that higher prices raise the producer surplus which is what we had seen before. For a very low price point say 25 rupees total producer surplus is 5. When the price increases we observe that the producer surplus goes on increasing. So, in these curves you will observe that as we increase the price as the pen curve moves up, we start seeing a larger producer surplus. This is the second key takeaway - higher prices raise the producer surplus.

And, in this curve what we observe is that at this price point, this is the producer surplus; at this price point we have not only this blue area, but this green area is also added to it; at this price point we have the blue, green and the pink areas. This total becomes the producer surplus, that is this triangle. This triangle is now telling us the producer surplus. If the price increases even further then we will even add this yellow area. So, as the price increases the producer surplus also increases.

And, the third key takeaway is that producer surplus is measuring the benefits to the sellers as they themselves perceive it. Why is that so? Because each seller has a particular cost of taking the good, a cost of providing it to the market and if the price point is greater than this cost of providing the good to the market, then the seller would himself or herself perceive that if I sell this good to the market at the prevailing price point, then I am going to earn a profit.

That is, I am going to increase the assets that I have, I am going to increase the welfare with me that is the producer surplus. Now, this decision is being made by the seller himself or herself. There is no third party who is telling the seller that you should sell this good at this price point because this much is your benefit. No, the seller is himself or herself making a judgment, looking at the prevailing market condition and looking at his or her own cost of production, to maximize his or her own welfare.

As we had seen before in the case of economics we assume that people are rational decision makers and in this case people are making a rational decision to sell or not to sell at any given price point based on what is their cost of providing the goods. And, this is a decision that everybody is making by themselves, not by any third party. So, in this case the producer surplus measures the benefits to the sellers as they themselves perceive it, not anybody else.

In this way we can say that to summarize total consumer surplus is the area between the demand curve and the price; lower prices raise the consumer surplus and consumer surplus measures the benefits to buyers as they themselves perceive it. That is, if we look at a market equilibrium, so, here you have the price, here you have the quantity and here we have the supply curve and here we have the demand curve. This is the equilibrium price. At this price the consumer surplus is given by this area.

The total producer surplus is the area between the supply curve and the price. Higher prices raise the producer surplus and producer surplus measures the benefits to the sellers as they themselves perceive it. That is to say in the case of this market equilibrium the producer surplus is given by this area that is between the price which is given by this line and the supply curve. So, this is how the surplus works in the market. That is all for today. Thank you for your attention. Jai Hind!