Conservation Economics
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Module 5
How can Economics help?
Lecture 3
Interdependence and gains from trade

Namaste!
We carry forward our discussion. And in this lecture, we will explore Interdependence and Gains from Trade. One question in economics that we should think about is why should people go for a trade. If I can do everything by myself should I not be doing everything by myself or are there certain advantages that I can gain by going for a trade, that is I do something, you do something, I give something to you, and you in return give something to me. So, that is trade.
And we begin this lecture by exploring what Adam Smith had said about trade. Why trade? It is a maxim of every prudent master of a family, never to attempt to make at home what it will cost him more to make than to buy. So, here Adam Smith is saying that for any prudent master of a family.
Remember that we had said that in economics we consider that everybody is a rational person. So, if somebody is rational, if somebody is prudent then what the prudent person does is that he or she never attempts to make at home what it will cost him more to make than to buy, which means that if suppose you can make potato chips at home or you can buy it from outside. Now, if you can make potato chips and if it is costing you 100 rupees for 1 kg of potato chips.
But when you go to the market you can find it for say 80 rupees. So, in that case it makes more sense to buy it from the market. So, it is a maxim of every prudent master of a family never to attempt to make at home, what it will cost him more to make than to buy. The tailor does not attempt to make his own shoes, but buys them of the shoemaker. Why? Because the shoemaker probably is able to make it at a cheaper cost especially because the shoemaker is in the profession of making the shoes.
He has all different kinds of equipment, he has sufficient training that is required to make the shoes. Now, because of having better equipment, because of having better training, the shoemaker is able to make a shoe for much cheaper than what it would have required the tailor to make a shoe.
So, the tailor does not attempt to make his own shoes, but buys them from the shoemaker. The shoemaker does not attempt to make his own clothes, but employs a tailor. Why? Because here again for making clothes it will require a very different set of equipment, it will require a very different set of training. And probably the tailor has those equipment, probably the tailor has that

training because of which he is in a much better position to make clothes much cheaper.
In this case the shoemaker buys the clothes from the tailor. He does not attempt to make the clothes by himself. The farmer attempts to make neither the one nor the other, but employs those different artificers. That is the farmer when he has to buy shoes, he goes to the shoemaker. When he wants to have clothes, he goes to the tailor. He does not attempt to make shoes or attempt to make the clothes because he is not a specialist, he does not have the equipment, he does not have the training.
And if he tried to make clothes or shoes then probably it will cost him much more than buying it from the market or from the tailor or from the shoemaker. Especially because in the case of a number of articles the equipment that is required are costly. So, probably the former can buy a pair of shoes for say 500 rupees.
But the equipment that is needed to make those shoes probably costs say 2 lakhs of rupees. Now, in that case it does not make any sense for the farmer to buy these equipment for 2 lakhs of rupees when he can buy a pair of shoes for just 500 rupees. So, this is what Adam Smith is saying.
The farmer attempts to make neither the one nor the other, but employs those different artificers. All of them find it for their interest to employ their whole industry in a way in which they have some advantage over their neighbours. So, everybody finds it in their own interest to employ their own industry, that is to devote their time and to devote their effort in something in which they have an advantage over their neighbours. And to produce with a part of its produce.
And to purchase with a part of its produce or what is the same thing with the price of part of it, whatever else they have occasion for. So, it is in the interest of everybody to spend their time and effort in something in which they have an advantage over their neighbours.
So, the tailor is spending his time and effort in making clothes because he has an advantage over the shoemaker and over the farmer in making clothes. So, if he makes clothes much more cheaply or in other words on any particular day he can make many more clothes than could be made by say the shoemaker or the farmer. So, in this case the tailor has an advantage over his neighbours in making clothes. Similarly, the shoemaker has an advantage over the tailor and the farmer in making shoes.
So, it is in the interest of everybody to employ their whole industry in a way in which they have some advantage over their neighbours. But because you require other things as well because the tailor requires shoes. So, what will he do? He will produce an excess of cloth he will then give these clothes to his neighbours.
And in exchange he will get the shoes or the food grains. So, he will purchase with a part of its produce which means that he is having an excess of cloth and he will use some part of this production that is these excess of clothes to purchase the other things. Now, in place of giving clothes the other way out is that he can use the price mechanism. So, with it he gives a cloth or whether he sells those clothes and gives the money is one and the same thing.
To purchase with a part of its produce or what is the same thing with the price of part of it whatever else they have the occasion for. Whatever else he wants to purchase he will use his excess clothes or he will use the money that he is getting from selling these excess clothes to

purchase whatever else he needs.

Now, this is something that we observe on a day to day basis. So, nobody tries to do everything because it is in their own self-interest. But what this small story is telling us is a few salient points. People do not make anything or do not do something in which case it will cost them more to make than to buy. So, this is the first thing. If there is something that you can procure at a cheaper cost than that of making then probably you will go for procuring it. And why do people do that? Why? Because people are rational beings.

So, any rational person would try to maximize his or her own resources. And so, if he or she can get something cheaply from some other place then they would prefer to get it than making everything by themselves. And why are they doing it? Because they are finding it in their interest.

In this case what Adam Smith is hinting is that they are not doing it because of a benevolence. So, the tailor when he is giving the clothes to the shoemaker in exchange for a pair of shoes, he is not giving these clothes by means of benevolence, he is not trying to help out the shoemaker. He is acting in his own interest. So, when we talk about trade it is in the interest of everybody and nobody is doing it for benevolence. So, all of them find it for their interest.

And what do they do? They do something in which they have some advantage over their neighbours. So, he is hinting that if there is an advantage that could be an absolute advantage or a comparative advantage. But if you have an advantage over your neighbours in doing something.

Then you should be doing that and not doing things in which you do not have an advantage because you are thinking rationally. Now, it is easy to understand trade if one person can only make one kind of good. So, if we have a situation in which it is only the tailor who can make clothes, the farmer cannot make any clothes, the shoemaker cannot make any clothes, and the shoemaker can make shoes, but the tailor cannot make any shoes the farmer cannot make any shoes because of whatever reason.

So, it could be that in this society it is prohibited for any person other than a tailor to make a cloth. Now, if you have a situation such as this then no doubt trade is inevitable because there is no way out that a tailor could have access to shoes other than by the means of trade because it is prohibited for him to make shoes. Or probably the only sewing machine in the society resides with the tailor and he says I am not going to give it to anybody else.

In such a situation there is no way that the shoemaker would have access to clothes, if he did not trade with the tailor. So, what we are saying here is that if there are say 2 formers and there are 2 goods, one is milk the other good is potatoes. Now, farmer 1 can produce any amount of milk in a day, but he cannot produce any potatoes and farmer 2 which is shown in this green color can make any amount of potatoes, but he cannot produce any milk.

So, what happens in this case? There is no way for farmer 1 to have access to potatoes if he does not get them from farmer 2, and similarly there is no way farmer 2 can have access to any amount of milk if he or she is not trading with farmer 1. So, if one person can make one sort of good and no other person can make that particular good then trade is inevitable. There is no way that trade would not happen in such a society. But the question is in the real world we do not find such a situation.

So, in a number of cases we can observe that a farmer can produce milk because he or she can have few cattle in his home or the farmer can produce potatoes as well. Now, the question is will they still trade if they can make both the things. So, we have a situation like this. So, we are saying that the farmer 1 can produce milk, but he is much better at producing milk than potatoes. Whereas, farmer 2 can produce potatoes he can also produce milk, but he is much better at making potatoes than milk.

Now, in this case what we are saying is that these farmers have different absolute advantages, that is the farmer 1 if he spends his time in producing milk then he can make much more amount of milk in a day than farmer 2. So, suppose both farmer 1 and farmer 2 decided that they are only going to produce milk. So, in that case farmer 1 will be producing this much amount of milk and farmer 2 will be producing this much amount of milk.

So, what we are seeing here is that farmer 1 has an absolute advantage in the production of milk. And similarly farmer 2 has an absolute advantage in the production of potatoes because farmer 2 can make this much amount of potatoes in a day, whereas farmer 1 could only produce this much amount of potatoes in a day.

So, if there is a difference in absolute advantages. What is the absolute advantage? The ability to produce a good using few inputs a fewer inputs than another producer. So, in this case, what we are observing is that to produce a quantum of milk. So, let us say that both the farmers have only 8 hours in a day in which they can work.

Now, let us suppose that farmer 1 can make say 8 litres of milk in a day, so in an hour he can make 1 litre of milk. Whereas, farmer 2 can only make 2 litres of milk in a day. So, what we are hinting here is that for farmer 1 he can make 8 litres of milk in 8 hours. And farmer 2 can only make 2 litres of milk in 8 hours.

So, this much is 8 litres of milk and this much is 2 litres of milk. Now, this would mean that to make 1 litre of milk the time required is 8 hours divided by 8 or 1 hour. Now, the input that is required to make 1 litre of milk in this case is 1 hour in the case of farmer 1. Whereas, in the case of farmer 2 what we are observing is that to make 1 litre of milk.

The farmer requires 8 hours divided by 2 litres which is 4 hours. So, in this case what we are observing is that farmer 1 can make 1 litre of milk using fewer inputs: just 1 hour of input whereas, farmer 2 can make 1 litre of milk using a larger amount of inputs that is 4 hours. So, in this case, the farmer 1 has an absolute advantage because he has the ability to produce a good, in this case the good is 1 litre of milk using fewer inputs than another producer.

Well, in this case the input is the time that the farmer is putting in. So, farmer 1 has an absolute advantage in milk production. Now, similarly in the case of potato production we will find that farmer 2 has an absolute advantage because let us say that the farmer 2.

Let us suppose that this much is 24 kg of potatoes and he is making 24 kg of potatoes in 8 hours. Whereas farmer 1, if he spends all his time all the 8 hours in making potatoes then probably he is able to produce only 4 kgs of potatoes in 8 hours. (Refer Time: 17:20) when there is one farmer who has an absolute advantage over both the goods.

Now, in this figure what we are observing is that the production possibility frontier for farmer 1 is here in red and for farmer 2 is here in green. Now, in this case when both the farmers are only

producing milk, then farmer 2 can make 24 litres of milk in 8 hours, whereas farmer 1 can only produce 8 litres of milk in 8 hours.

Here we are observing that farmer 2 has an absolute advantage over farmer 1 in the production of milk, that is we can make milk using fewer inputs. In this case, if you look at the time that would be required, so for farmer 2 in 8 hours he can make 24 litres of milk which means that to make 1 litre of milk he requires 8 by 24 is 0.33 hours Now, this is the input in terms of time that he requires to make milk 1 litre of milk. Whereas, farmer 1 for him in 8 hours he is making 8 litres of milk.

To make 1 litre of milk he requires 8 by 8 which is 1 hour. Now, in this case, it is easy to see that farmer 2 has an absolute advantage over farmer 1 because he can make the good in this case 1 litre of milk using fewer inputs that is just one-third of an hour as compared to the second as compared to farmer 1. So, farmer 2 has an absolute advantage here farmer 2 has absolute advantage. Now, this is for milk production. Now, let us look at potato production.

Now, in this case farmer 2 in 8 hours if he only produced potatoes he would have made 48 kg of potatoes. So, to make 1 kg of potatoes he requires 8 by 48 which is 1 by 6 hours or 10 minutes. Now, let us look at farmer 1. Farmer 1 in 8 hours if he only produced potatoes he would have produced 32 kgs of potatoes, which means that to make 1 kg of potatoes he requires 8 by 32 is 0.25 hours which is 15 minutes. Now, in this case, when we talk about potato production.

Farmer 2 requires 10 minutes and farmer 1 requires 15 minutes. So, here again we are observing that farmer 2 requires less inputs, he requires only 10 minutes of input, whereas farmer 1 requires 15 minutes of input. So, in this case farmer 2 has an absolute advantage. So, what we are observing here is that when we talk about potatoes, farmer 2 has an absolute advantage, when we talk about milk farmer 2 has an absolute advantage. So, farmer 2 in this case is having an absolute advantage.

In both these goods potatoes as well as milk. So, now the question is if farmer 2 is more efficient at producing potatoes and he is more efficient in producing milk as well, should he go for a trade. Does it make any sense for both of these farmers to go for a trade? And that is the question.

And as we will see, yes, here again there is an advantage. Then both of them went for a trade. So, here we come to the concept of comparative advantage. So, absolute advantage as you remember is the ability to produce a good using fewer inputs than another producer and in this case farmer 2 has an absolute advantage over farmer 1 over good the goods. But then there is a difference in comparative advantage. Comparative advantage is the ability to produce a good at a lower opportunity cost than another producer.

Comparative advantage is the ability to produce the good at a lower opportunity cost, not using fewer inputs, but at a lower opportunity cost than another producer. And in this case, opportunity cost is defined as whatever must be given up to obtain some other item. So, if we look at this curve again, farmer 2 could produce 24 litres of milk in 8 hours.

If he devoted his time completely to the production of milk. Or he could have made 48 kgs of potatoes, if he spent all his time making potatoes which means that for farmer 2, 24 litres of milk is equivalent to 48 kgs of potatoes. And for farmer 1, he could have spent his 8 hours either to make 8 litres of milk or to make 32 kgs of potatoes.

Now, which means that for farmer 1, the milk production could be as high as 8 units. So, farmer 1, the milk production is as high as 8 units and the potato production is as high as 32 kgs. The potato production is 32 kgs. So, the opportunity cost for 1 unit of milk production is 32 by 8 which is 4 units of potatoes. So, this is the opportunity cost. What is he giving up? To make 8 units of milk he is giving up 32 units of potatoes. So, to make 1 unit of milk, he is giving up 32 divided by 8 is 4 units of potatoes.

So, this is the opportunity cost for farmer 1 for 1 unit of milk production. And similarly, the opportunity cost for 1 unit of potato production is 8 units of milk divided by 32 is 0.25 units of milk. So, these are the opportunity cost for farmer 1. The opportunity cost for 1 unit of milk is 4 units of potatoes and the opportunity cost for 1 unit of potato is 1 by 4 or 0.25 units of milk. Now, similarly for farmer 2 he could have made 24 units of milk or 48 units of potatoes.

If farmer 2 devotes all his time for milk production, he makes 24 units. If he spends all his time on potato production, he can have 48 units of potatoes. So, the opportunity cost for 1 unit of milk production is how much amount of potatoes is he giving up to make 1 unit of milk, to make 24 units of milk he is giving up 48 units of potatoes because when he is devoting all his 8 hours into milk production he is having 0 units of potatoes. So, he is giving up 48 units of potatoes.

To make 1 unit of milk he is giving up 48 by 24 is 2 units of potatoes. And similarly, to make 1 unit of potatoes he is giving up 24 by 48 is 0.5 units of milk because to make 48 units of potatoes he is giving up 24 units of milk. So, to make 1 unit of potato, he is giving up 24 by 48 is 0.5 units of milk.

Now, if we make a table of the opportunity cost of both of these farmers. For farmer 1, we have seen that the opportunity cost for milk is 4 units of potatoes. So, the opportunity cost for 1 unit of milk is 4 units of potatoes and the opportunity cost for making 1 unit of potato is 0.25 units of milk, which we are writing here is 0.25 units of milk.

For farmer 2, the opportunity cost for making 1 unit of milk is 2 units of potatoes, 2 units of potatoes here and the opportunity cost for making 1 unit of potato is 0.5 units of milk which we write here 0.5 units of milk. Now, if we look at farmer 1, he has a comparative advantage in producing potatoes because to make 1 unit of potato he needs to give up only 0.25 units of milk whereas, farmer 2 would have to give up 0.5 units of milk.

So, farmer 1 is giving or he is leaving out only 0.25 units of milk for 1 unit of potatoes, whereas farmer 2 has to give up a lot more, double the amount to make 1 unit of potato. So, farmer 1, we can see that he has a comparative advantage for potato production. And similarly, when we talk about milk production farmer 2 will have to give up only 2 units of potatoes for 1 unit of milk, whereas, farmer 1 would have to give up 4 units of potatoes.

Farmer 2 has a comparative advantage when it comes to milk production because he has to give up only 2 units of potatoes whereas, farmer 1 would have to give up 4 units of potatoes. So, farmer 2 has a comparative advantage for milk production. So, here even though farmer 2 was having an absolute advantage in both potato production as well as milk production, what we are observing is that while farmer 2 has a comparative advantage for milk production.

He does not have a comparative advantage for potato production. Farmer 1 has the comparative advantage. Now, in the case of trade, people can go for a trade because they have different

comparative advantages. And so, if they go for a trade then it will be for their own mutual advantage. Through trade they can get the product at a cost lower than their own. So, here again what we are observing is that if somebody can get something from the market at a cost that is lower than his or her own cost of production.

Then it is to their own advantage to take it from the market. Which means that they should go for a trade because through trade they will be able to get these 2 items: milk and potatoes at a cost that is lower than what they would have cost to make at home. So, the farmer 1 who has a comparative advantage for potato production should produce more potato than what he needs and the excess he should sell to the market in exchange for milk.

And the farmer 2, because he has a comparative advantage for milk production should produce an excess of milk than his own requirements and sell the excess in the market in exchange for potatoes. So, trade promotes specialization in activities where people have a comparative advantage.

It is to the advantage of both the parties that they should be making things for which they have a comparative advantage. Never to attempt to make at home, what it will cost them more to make than to buy, in their own interest and in things in which they have some advantage over their neighbours.

So, this maxim from Adam Smith is what actually drives the trade. So, the question is, suppose there is a heart surgeon who also happens to be the fastest typist in the world. Should he type himself or should he hire someone else? And why? Now, the question is whether there is a heart surgeon who has an absolute advantage in both heart surgery as well as in typing because he can type fastest in the whole world. So, he can type faster than any other typist.

But then even though he has an absolute advantage, he would be having a comparative advantage in only one of these two fields. And so, he should not do the typing himself, he should hire someone because he has a comparative advantage in heart surgery and if he has a competitive advantage in heart surgery, he probably does not have a comparative advantage in typing. So, for instance, in one hour if he was doing a heart surgery, say he was earning 10000 rupees, but he could hire a typist for say 100 rupees for an hour.

So, if he is giving up heart surgery or he is giving up 1 hour that he could have given to heart surgery and if he is typing by himself then probably he is not doing prudently. He is not acting rationally. So, trade can make everybody better off because it permits you to do things where you have a comparative advantage.

And for things where somebody else has a comparative advantage you take those goods or services from that person. So, here the heart surgeon should not be doing the typing himself. He should be hiring a typist, even though he has an absolute advantage when it comes to typing.

Now, the next question is what should be the price of trade? That is at what rate should 1 unit of milk be exchanged in the market for potatoes. Now, remember that people were going for trade because it was in their own advantage, they were acting in self-interest, they were not acting in benevolence.

So, nobody is doing a trade to benefit the other party. They are getting into trade because it is to their own advantage. Now, if we talk about the cost of making milk for farmer 1 the cost of

making milk is 4 units of potatoes. Now, if somebody says that he should give up 6 units of potatoes for 1 unit of milk would he agree? And probably not. Why? Because he would say that if I can get a unit of milk from 4 units of potatoes why should I pay 6 units of potatoes?

But if somebody says that ok, we are going to offer you 1 unit of milk for say 3 units of potatoes, then this farmer would think, ok if I made 1 unit of milk myself it would have cost me 4 units of potatoes. But in the market I am getting it for 3 units of potatoes. So, probably it's good for me. Probably I should take up this offer.

Now, similarly when we talk about farmer 2 to make 1 unit of milk he is sacrificing 2 units of potatoes. So, that is the opportunity cost for 1 unit of milk on this farmer 2. Now, if in the market he gets this offer that to get 1 unit of milk you should give up 3 units of potatoes. Now, would this farmer agree?

Well, probably not. Because he would again say that I can make 1 unit of milk myself by just 2 units of potatoes, why should I pay 3? But if he gets an offer of 1 unit of milk from just 1 unit of potatoes he would agree because it is costing him 2 units of potatoes, if he can get it for 1 unit of potatoes he will be happy.

There is a price at which farmer 1 is happy which is if he gets it at anything less than 3, anything less than 4, there is a price at which farmer 2 is happy and is agreeable, if he is getting it for anything that is less than 2. So, there are different prices at which both of these farmers can agree. And similarly, for 1 unit of potato, if farmer 1 can get 1 unit of potato for anything that is less than 0.25 units of milk, he would agree because it is to his advantage.

Similarly, for farmer 2, if he gets 1 unit of potato for anything less than 0.5 units of milk he would agree because it is costing him 0.5 units of milk. If he can get 1 unit of potato from the market at a lesser cost then probably he will go for it. Now, for both the parties to gain from the trade the price must lie in between these 2 opportunity costs.

So, suppose we decide that the price is 3 units of potatoes for 1 unit of milk. So, here 1 unit of milk was costing farmer 1, 4 units of potatoes and farmer 2, 2 units of potato. We take something in between. So, we take 3 units of potatoes for 1 unit of milk. Now, if this happens would these 2 farmers agree to go for a trade as we are interested in knowing?

Now, to understand the impact of trade let us also consider that earlier the farmers were devoting half their time to producing milk and half their time to producing potatoes, that is they were spending 4 hours in producing milk and 4 hours in producing potatoes. So, what was the situation before the trade?

Now, here we are looking at farmer 1 and farmer 2 production and consumption without gain. Now, before these 2 farmers were entering into trade, the amount of milk and the amount of potatoes that they were producing was also the amount that they were consuming because they are not getting anything from outside and they have all what they are producing for themselves. So, the amount of production is equal to the amount of consumption.

Now, for farmer 1, he was devoting 4 hours to make milk and 4 hours to make potatoes. Now, for farmer 1, in 8 hours he could produce 8 units of milk, so in 4 hours he will be producing half of that which is 4 units of milk. And in 8 hours he could have produced 32 units of potatoes, so in 4 hours half of that he would be producing half of 32 which is 16 units of potatoes which is

what we are seeing here. If he only makes milk for 4 hours he gets 4 units of milk and in 4 hours he is getting 16 units of potatoes.
Now, in the case of farmer 2, if he devoted 8 hours for milk he made 24 units of milk. Now, if he devoted only 4 hours he would be making half of that which is 24 by 2 is 12 units of milk which is what we are seeing here. In 4 hours he is producing 12 units of milk.
And in 8 hours he could have produced 48 units of potatoes and so, in 4 hours he would be making half of that 24 units. So, this is what we are seeing here. He is making 24 units of potatoes in 4 hours. So, because the amount of production is also equal to the amount of consumption.
So, here farmer 1 is consuming 4 units of milk and 16 units of potatoes, and farmer 2 is consuming 12 units of milk and 24 units of potatoes. Now, here again what we are seeing is that the farmer too has an absolute advantage over both milk and potatoes, and so, he is consuming more milk and he is consuming more potatoes as compared to farmer 1. Now, when they go for trade and in the case of trade the price is decided as 3 units of potatoes for 1 unit of milk.
Now, what happens? Now, suppose farmer 1 because he has a comparative advantage in making potatoes. So, we saw it here, that to make 1 unit of potato he has to give up 0.25 units of milk, whereas farmer 2 would have to give up 0.5 units of milk. So, he has a comparative advantage in the production of potatoes. So, farmer 1 decides that I will spend all my 8 hours making potatoes. So, he is spending all 8 hours for potatoes and so, he has 0 hours for milk.
Now, in 8 hours farmer 1 can produce 32 units of potatoes, so which is what we are seeing here. So, he is producing 32 units of potatoes and 0 units of milk. Now, farmer 2 has a comparative advantage when it comes to milk production. So, in the case of milk, farmer 2 has the cost of 2 units of potatoes for a unit of milk, whereas farmer 1 has 4 units of potatoes for 1 unit of milk. So, farmer 2 has a comparative advantage. Now, in this case, suppose farmer 2 decides that I will spend 6 hours making milk.
And only 2 hours to make potatoes. Now, here again it is important to note that when we are talking about trade we are not saying that you should only be doing things where you have comparative advantages. You can even be doing things where you do not have a comparative advantage because probably the market is not able to supply you with all the things that you need. So, in that case even though it is not a comparative advantage you could be making certain things.
But here what farmer 2 is saying is that because he has a comparative advantage for milk production, he is devoting a larger amount of time for milk production and a very small amount of time for potato production. Now, in 6 hours what is the amount of milk that he will be producing? In 8 hours he makes 24 units of milk.
So, in the case of farmer 2, in 8 hours he makes 24 units of milk which means that in 1 hour he would make 24 by 3 by 8 is 3 units of milk, and in 6 hours he would be making 3 into 6 is 18 units of milk. So, in 6 hours he is making 18 units of milk. And he is only spending 2 hours on potato production.
Now, in this case what we are saying is that when we talk about potato production, farmer 2 in 8 hours could have made 48 units of potatoes. So, in 1 hour he would have made 48 by 8 which is

6 units of potatoes. So, in 2 hours he makes 6 into 2 which is 12 units of potatoes, which is what we are putting here.
So, in 2 hours he is making 12 units of potatoes. So, once they have agreed to go for trade this is the amount of items that these farmers are producing. Farmer 1 is producing 0 units of milk and 32 units of potatoes, farmer 2 is producing 18 units of milk and 12 units of potatoes.
Now, they have decided that the price is 3 units of potatoes for 1 unit of milk. Now, suppose they are going for this trade. So, 1 unit of milk is 3 units of potatoes. So, farmer 1 decides that he will give 15 units of potatoes to farmer 2. So, here because of trade he is giving up 15 units, so we are writing it as minus 15 and farmer 2 is getting 15 units of potatoes. So, we are writing it as plus 15. Now, because the price of potatoes is 3 units of potatoes is 1 unit of milk.
So, 1 unit of potato is 1 by 3 units of milk, 3 units of potatoes is equal to 1 unit of milk which means that 1 unit of potatoes is equal to 1 divided by 3 units of milk. So, 15 units of potatoes is equal to 1 by 3 times 15 which is equal to 5 units of milk. Now, with this price 3 units of potatoes is 1 unit of milk 15 units of potatoes is equivalent to 5 units of milk. So, because farmer 1 was giving 15 units of potatoes to farmer 2, he will be getting 5 units of milk in return.
So, farmer 2 is giving 5 units of milk. So, we are writing it as minus 5 and farmer 1 is getting 5 units of milk which we are writing as plus 5. So, what is the consumption after the trade? Now, for farmer 1 he was not producing any milk, but he is getting 5 units of milk from farmer 2. So, the total unit that he has now is 5 units 0 plus 5. He was producing 32 units of potatoes, he gave up 15 units of potatoes to farmer 2 and so, he is left with 17 units of potatoes.
So, the consumption after trade for farmer 1 is 5 units of milk and 17 units of potatoes. Now, similarly for farmer 2 he was making 18 units of milk, he gave up 5 units to farmer 1 and so, he is left with 13 units of milk. And he was making 12 units of potatoes. He got 15 units from farmer 1, and so now, he has 27 units of potatoes.
Now, what is the gain from trade? Is there any increase in consumption or is there a decrease in consumption? So, earlier without trade farmer 1 was having 4 units of milk after trade he had 5 units of milk. So, there is an addition. So, because of this trade he can consume one extra unit of milk. What about potatoes earlier? He was consuming 16 units of potatoes, now he is consuming 17 units of potatoes which means that the potato consumption has also increased.
So, here farmer 1 is consuming more of milk and more of potatoes because of the trade which means that farmer 1 has added to his well-being he has added to his advantage. Earlier he was consuming less milk and less potatoes, now he is consuming more milk and more potatoes. What about farmer 2? Earlier he was consuming 12 units of milk, now he is consuming 13 units of milk which means that he has an advantage of plus 1. So, he is now consuming more milk.
What about potatoes? Earlier he was consuming 24 units of potatoes, now he is getting 27 units of potatoes to consume. So, now, he has an advantage of plus 3 units. So, he is consuming 3 extra units of potatoes than what he was consuming before the trade. Even in the case of farmer 2, he is now consuming more milk and more potatoes. So, it is adding to his well-being or his welfare as well. So, what we are observing here is that because of trade both farmer 1 and farmer 2 have increased their consumption.
They are now having more resources. So, trade has added to the benefit of both of these parties.

Trade has benefited farmer 1 and it has also benefited farmer 2, which means that when we said that the trade increases the welfare of all the parties involved this is an example of that.

Now, how can this trade happen? This trade can occur in 2 ways. There could be a barter system. Now, in the case of a barter system what happens is that both of these parties come to the market and they exchange these goods with each other. So, for 3 units of potatoes they exchange it for 1 unit of milk. So, both these farmers will go to a market with their produce of potatoes and milk that they want to trade, and there they will be exchanging these two amongst themselves.

The other way is through a market using currency. So, this trade can occur through a barter system or in a market. And in the next module we will have a look at the markets. So, essentially what we are seeing in this lecture is that we began with this thing from Adam Smith that if you can get something cheaply from the market then what it costs you to make at home you should probably get that thing from the market. Because rationally it would be to your own benefit, it would be in your own interest.

And this interest or this sort of a trading helps people to do those things where they have an advantage over their needs. Now, this advantage could be an absolute advantage or a comparative advantage. So, we observed that if we have a society where one good can only be made by one person and the other good can only be made by the second person, then of course, trade is inevitable because if the first person wanted to have access to the second thing he could only get it through by means of trade.

Trade is also very obvious if both the parties have an absolute advantage over something. So, if farmer 1 has an absolute advantage in production of milk and farmer 2 has an absolute advantage in the production of potatoes, then trade becomes obvious. And here we define absolute advantage as the ability to produce a good using fewer inputs than the other producer. So, absolute advantage means that you are requiring less amount of inputs than the other producer probably because you are more efficient.

So, the absolute advantage is talking about efficiency. But then even in cases where you do not have an absolute advantage then to trade makes sense if there is a difference in the comparative advantage. And comparative advantage is the ability to produce a good at a lower opportunity cost than the other producer.

Where opportunity cost is defined as what must be given up to obtain some other item. Now, the concept of comparative advantage is important because even though a person has an absolute advantage in doing one or more of things, he may not be having a comparative advantage over all of them. Because there are some activities that pay at a much greater rate than some other activities. And we looked at the example of a heart surgeon who is also a very good typist.

Now, if he is doing heart surgery he can earn much more per hour than when he can do it when he is typing. So, it makes much more sense for the heart surgeon to devote his time to heart surgery, earn a lot more and then spend a part of it to hire a typist. So, comparative advantage tells us why even though there could be some people who have an absolute advantage in doing many things, they should still go for a trade and trade is still going to make them better off.

Next, we had a look at this case where there is a farmer who has an absolute advantage over 2 goods, both milk production and potato production. And we saw the opportunity cost for both of

these farmers for both of these goods. And when we look at the opportunity cost.
We will find that there is some good for which there is a greater comparative advantage for one party than the other party. Now, of course, if both of these farmers were making things at a proportional rate that is if both of these curves were parallel to each other then it is also possible that there is no party who is having a comparative advantage because say farmer 2 was producing 24 units of milk or 48 units of potatoes and farmer 1 was producing either 8 units of milk or 16 units of potatoes.
So, in that case, the ratio would have been the same for both the farmers 24 by 48 is 0.5 and 8 by 16 is 0.5. And in that case, the opportunity cost for these items would have been the same for both these parties, but then in a real life situation we do not just have 2 parties, we have multiple parties. So, in that case, there would have been some other person who would be having a difference of opportunity cost. So, when we talk about markets we talk about a number of buyers and a number of sellers.
So, which makes trade even more lucrative. But in this case what we observed was that there was a difference in the opportunity cost. So, while farmer 1 was having a comparative advantage for potato production because for 1 unit of potato he was costing him 0.25 units of milk.
Whereas, for farmer 2 it was costing him 0.5 units of milk. So, farmer 1 was having a comparative advantage for production of potatoes. Similarly, farmer 2 was having a comparative advantage for the production of milk because it cost him only 2 units of potatoes whereas, it cost farmer 1 4 units of potatoes.
So, farmer 2 has a comparative advantage for milk production. And in such a case, it is to the benefit of both of them that it is in their own interest to buy things from the market that are available at a cost that is lesser than their own opportunity cost. And so, we can say that they should spend their time doing what is providing them a greater advantage over their neighbours. And here we observed that if they decide at a price that is in between both of these opportunity costs.
In our example they had decided that it should be 3 units of potatoes for 1 unit of milk or in other words 1 by 3 units of milk for 1 unit of potato. So, 1 unit of potatoes is equal to 1 by 3 units of milk which is 0.33 units of milk. Now, we can observe that 3 is between 4 and 2, and 0.33 lies between 0.25 and 0.5. So, if they come to a figure that is in between their opportunity cost then that could be a good price point at which they can trade.
And when they do this trading we observe that they are increasing their consumption of both milk and potatoes. So, there is a gain of trade for both the parties, which is what we had observed in the 10 principles of economics. Trade can make everyone better off. So, that is a short introduction about what is trade and why people go for trade.
And as we will observe in the later lectures, this trade can have a very important ramification for conservation because people might even go for a trade for those items that harm the environment. We will build upon this topic in the later lectures.
That is all for today. Thank you for your attention. Jai Hind!