Inclusion and Technology Design
Prof. Sanjay V. P.
Centre for IT and Public Policy (CITAPP)
International Institute of Information Technology, Bangalore

Lecture - 10
ICTs in Agricultural Markets - Are they Inclusive?

Good morning. Professor Amit has set it up very nicely, but I cannot do in the style that he does he is informed ok. So, I will try. I will start with a small story ok. When I was coming in the morning today institute, I used an Ola taxi. Generally I end up talking to them, it is a 1 hour drive. The guy's name was Nanjunde Gowda.

And he comes from Turuvekere. Turuvekere is in Hassan district. I was trying to find out his background. He owns about 10 acres of land, about 5 years ago only in coconut plantation that his grandfather had developed it dried up because there was drought. And he lost the whole yield and he was reduced to no income.

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He went into areca nut, he planted areca nut, areca nut has a 8 year cycle before it starts yielding in cropped that you can put into the market. And in the interim of it, he went into banana cultivation, because he saw Bangalore is a very big place lot of people you know use fruits. So, he thought that he will make good money on that. He expected to make about 4 lakh rupees of money invested about 2 lakh rupees last year in banana. It was diseased, and he lost all the yield he is now in debt 2 lakh rupees. And the

alternative was he put little more money investment bought a car and tied up with Ola, and he is now driving in Bangalore.

When you go back today, if you use Ola, talk to the guy 80 percent of the time you will find these guys are from Mahagada, Chikkaballapur, Kolar, Hassan, Kanakapura, the story is same. Farm holdings, no water, irrigation may not be there, bore wells are failed, they do not get par in the time that they want to do the cultivation or when the plant need water, they are in debt. They find a way Bangalore has need of taxis, and they are driving taxis.

But now we are also talking about a autonomous, cars what do these people do when autonomous cars come in, where do they go next? They had agriculture, they moved into taxi driving. And when they do lose that occupation, where will they go next ok. I leave that story with you. And then I go into agriculture markets, try to see how agriculture markets and technology used is happening in agricultural markets. And questioning whether these are inclusive the use of technology is inclusive or not.

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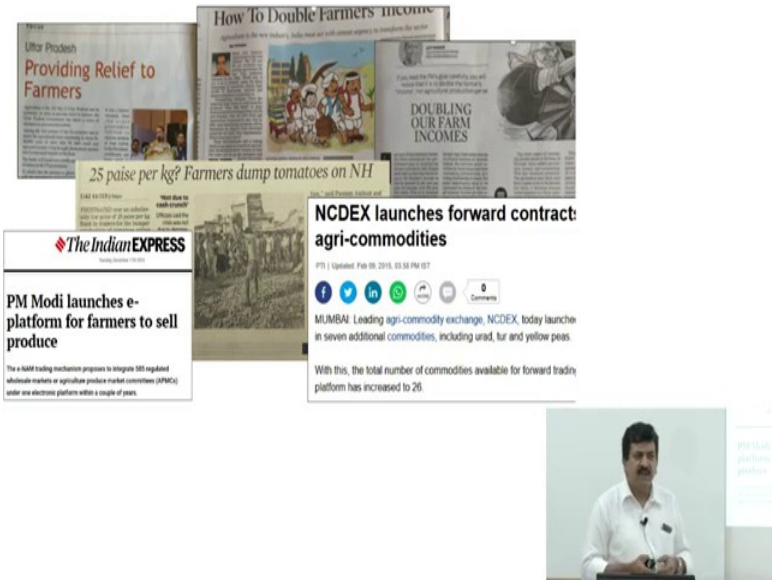

It is a very famous topic today, every newspaper article shows up something on agriculture marches us to Mumbai, siege of Mumbai going to Delhi from very long distance. People asking for loan waiver huge amount of discussion on social media why people should be given money just like that, what is the reason, are these people working at all, why should the taxpayer pay money to the farmer, now, quite a few things.

Karnataka government itself May 14 the election was over I think the counting was also over, the first thing that they announced was loan waiver. And loan waiver has not yet happened, announcement happened people have forgotten, but loan waiver has not happened.

I am not saying I support loan waiver, but am I am just saying to the gap between what is spoken versus what happens on the ground. You also will see certain headlines like endowers to double farmers income, there is a lot of thought going in many think tanks thinking, but how could double the farmers income. And there are some targets also, you can see over Honorable Prime Minister trying to really push that wheel forward the bullock cart wheel.

You will also see a farmer dumping tomatoes on a national highway trying to make a statement that nobody is there to buy his produce. So, it is a sector which has huge problem. I did not put one news headline which is about the suicides, the farmer suicides is not just limited to India, there are larger number of suicides which happen in China. So, we share this problem across many different countries in the developing world in Africa, in South Asia, which are in the developing areas. I also put two more brighter looking news headlines, these are from internet I choose them purposefully just to show you technology.

One of them was launch of e-market by the Prime Minister use of electronics in market operations. And another is futures and spot commodating markets being allowed to trade in agriculture, and increasingly using you know trading on many different commodities. And obviously, both these are what we call as online market, online obviously, means a huge use of ICT.

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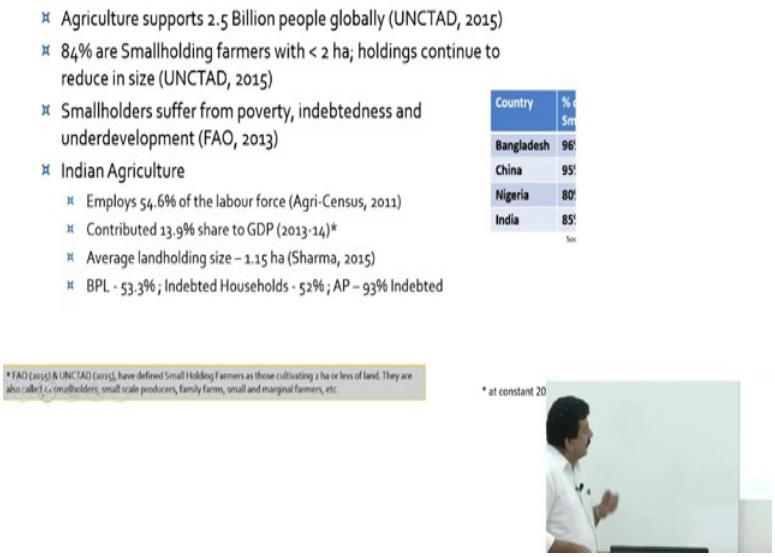

Now, why is ICT agricultural we talking a lot about it? The reason we are talking about agricultural is I think I gave you the story, I also gave you set of headlines there. A huge number of people in the world still depend on agriculture as a occupation. A largely developing world, I think more than 50 percent people depend on agriculture, in some countries in Africa 70 percent people depend on agriculture. In India about 55 percent people work in agriculture sector. It supports about 2.5 billion people, third of world's population work in agriculture.

Another interesting characteristic of agriculture is 80, 85 percent of the people are what we tag as small holding farmers. People who have less than 4 acres of land, and lastly they cannot hire external labor, they provide their own labor, the family provides their own labor. They may have about 4 to 5 heads of cattle in their household, and they may use all their time, energy to grow of crops and get money out of it. And these holdings actually are dropping.

In India for instance in 1970s the average holding size was about 2.3 hectares. A hectare is about 2.2, 2.25, 2.5 acres. And it that is today about 1.15 hectares, this could be for variety of reasons. It could be property division; it could be you know variety of reasons, but the land holding is dropping. What it means is you will find the small holding farmers becoming more and more important, because their percentage is growing.

There is also another common thread which runs in the small holding farmers, the common thread is they are all indebted. They all have huge debts. Debts which are in formal sector, debts which are in informal sector, there could be money lenders, there could be banks, it could be any type of debt. There is also poverty. And this is a global phenomenon, and they are also underdeveloped. Underdeveloped in is in terms of health care, in terms of road infrastructure, in case in any way in every way you may want to compare, they do have certain shortages.

And specifically in India for example, 93 percent of the farmers in Andhra Pradesh are in debt. In Karnataka, it is about 75 or 80 percent, but that is a the story which is very compiling to hear. And also if you see the small holding percentage in other countries were also very large in Bangladesh, China, it is a very common story.

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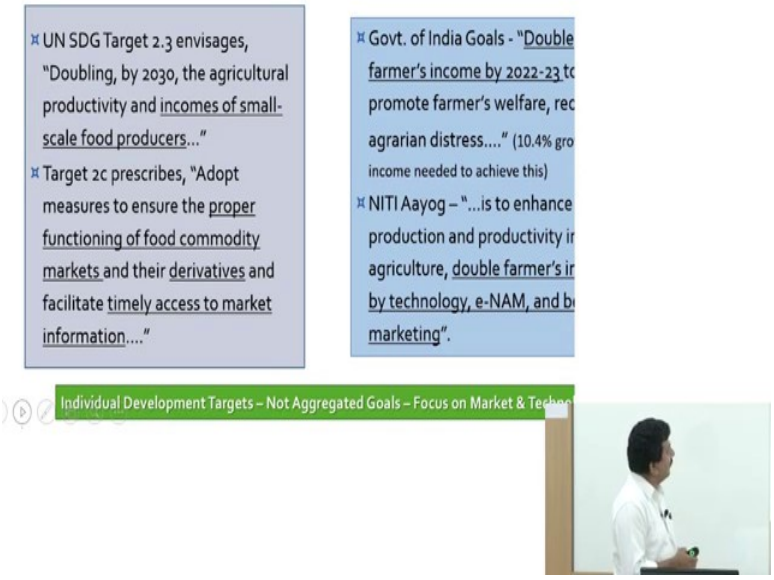

Now, being that these kind of issues exist, lot of focus is there from the multilateral development agencies like World Bank, FAO even the Government of India, all of them are making many targets. SBG which came after the millennium development goals, sustain in the development goals.

It talks about very specific things doubling the farmer income by 2030. And this achieved through productivity increases in agriculture, this achieved on very specific areas like proper functioning of market and their derivatives as well as timely access to market information I just underlined them because those are very important words.

And the incomes are very specifically a small scale food producers. The small holders that I call are known differently in different places marginal farmers, small farmers, small holders, they all mean the same thing. And in India we have a little more aggressive targets doubling the farmers income by twenty to 2022.

And NITI Aayog, which is the S12 planning commission, they have a very specific path deterministic approach to this also, very very technology deterministic there, enhance productivity and double farmers income by use of technology e-NAM, e-NAM is electronic national agricultural market. So, market focus is common between both, and also better marketing. Better marketing in terms of timely access to market information etcetera.

So, if you see the key thing here are three things, one is focus on market and on technology. Second is it is not aggregated goals. In the past, lot of aggregated goals used to be spoken about. Agriculture sector should grow by ten percent you know x, y, z, kind of stuff which were you know unique parameters, but what they are now talking about in individual development targets. Incomes of all the small holders not just one small holder or a percentage, but everyone's income is what is being spoken.

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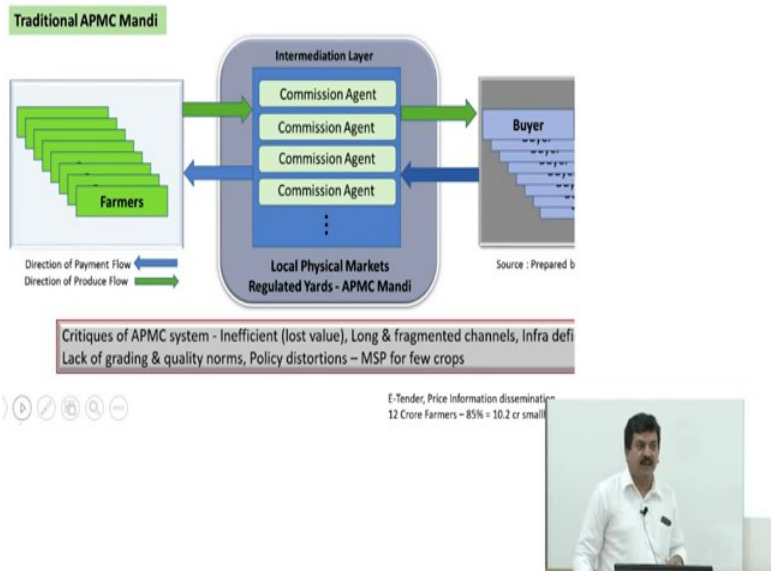

Now, having spoken about all that in market and technology, I wanted to give you a snapshot of how a market will look like in in terms of a block diagram, a flow diagram if you will. The way it was and how it is transforming, because I am going to talk about in

this talk, how the markets are where and how it is getting transformed, and what kind of effects are there from ICT etcetera. So, the typical market in India and in large part of the globe in the developing world is regulated it continues to be regulated by the government. Generally the market in India use to be what we call as run by APMC, APMC stands for agriculture produce marketing commission, each state has a commission and they are designated to run market committees.

Student: Committee.

Committee, yes I am sorry I missed it there. And these people are supposed to run the market as well as there is a set physical space bounded physical space in which the sellers have to bring their produce and the buyers can come and pick up that produce. The intermediation layer is performed by what we call commission agents. These commission agents are registered with the APMC, they can do the I you know intermediation between the seller and the buyer.

And was there a question or something? And what these people do is the farmers brings that produce in, it is put of a display by the commission agent, and the buyers come in they give bids, the bid methods are different, different crops have different bid methods. Some of them are like open outcry method, some of them use IT a process like e-tender etcetera.

Student: What is open outcry?

Open outcry is like you have the produce on display and the commission agent is auctioning. So, we calls for bids, the buyers will come and loudly cry about the price they want to give. And whoever out bids that guy has the right to pick up that produce, so that is called an open outcry method. So, the open outcry is basically to create some amount of transparency that everything is above more.

Whereas, in the e tender these are what is called as closed, so the buyer puts in a tender into the e-tender application. And the application looks at who has given the highest bid, and it chooses that bid as the bid which is one that particular transaction, but there are certain critics to this. A critic is that there is inefficiency there is inefficiency because people have to bring produce to some physical location, and the buyer has to come and pick up the produce from that physical location.

When he is moving across states, there are multiple taxes he does not get the permit to move the produce across different you know states very easily. The commission rates are very different. Sometimes we also speak about long fragmented change because you know when you are moving across multiple towns, you have to go through many of this transaction again and again. And therefore, the farmer's value, when it translates to let us say the produce on your table versus what he gets as real income is varying.

There is also a critic about infrastructure deficit. For example, in India we have 30,000 APMCs. And in that I think they do a square kilometer market plus square kilometer, it comes to about 454 square kilometers one market. So, the farmer may have to travel as far as that distance. Food FAO has a prescription that a market should be in the vicinity of about 80 square kilometers. So, there is a huge infrastructure deficit. And many of these infrastructure deficit, I will talk about it a little, little later may be addressed through technologies what is the policy is moving towards.

Lack of grading and quality norms, there is very less approach to how to grade and qualify things. No cold storages, you cannot store a produce, you should bring to the market, you have to sell it and go kind of stuff. And also there is something called policy distortions. Policy distortions typically talk about interventions need by the government in market place.

One of them is what is called as a minimum support price minimum support price is something that is extended to a farmer saying that that must be the minimum at a market place. But in reality minimum support price actually becomes the bench mark, so it is actually the maximum yield price.

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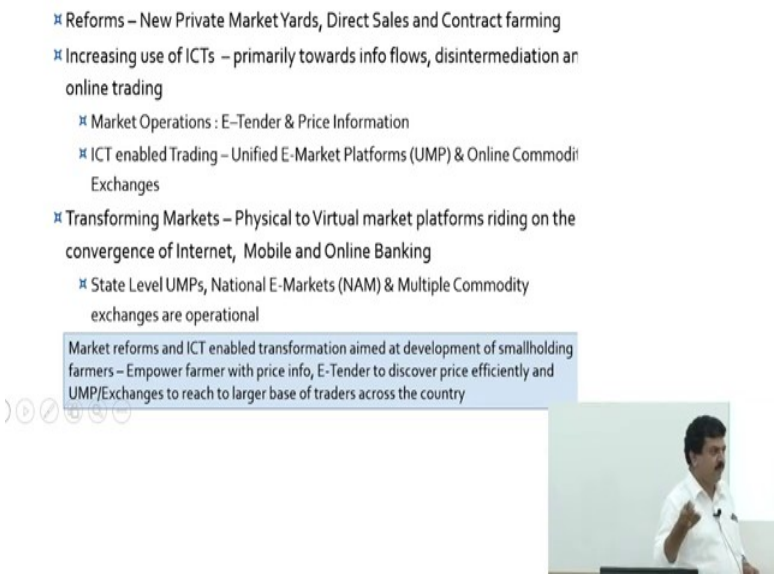

Student: Permissions are (Refer Time: 16:23).

6 percent.

Student: (Refer Time: 16:26).

In Karnataka, it is about 6 percent. In 6 percent which is paid by the buyer a percentage is given to the APMC for earning the services 5 percent goes to the commission like that. Farmer is not suppose to pay any commission officially, but there are certain markets where to get your produce to the right front row to get it in the right place for display, and you need to review your commission.

Student: And at the commission percentages are generally transferred.

It is opaque; it is very different for different AMC.

Student: (Refer Time: 17:01).

APMC, but what happens is on the ground there itself it is there written in paper what should be the percentage, but it depends on how much influence you carry, your produce is displayed in that way. So, you do have what is called as some relationships that goes beyond it, but on the paper it is only no. I Now, when we are talking about transforming markets, now these markets are transforming, these markets are transforming because

people have found and there are issues with the existing market. So, there is continuous approach to transformation, lot of reforms have come in.

One of the reform is to allow private market debts, private markets are one of the good example (Refer Time: 17:46) from ITC. Similarly, there are other purchasing outlets by large agriculture buyers, produce buyers. Direct sales is allowed now. So, a seller and buyer can interact without their commission agent outside an APMC, and buy and sell things. Contract farming is also allowed. Large companies who may be in agriculture produce value addition can contract a farmer with certain very specific price points and buy it guarantee is in a part of you these now.

Student: So, this (Refer Time: 18:21).

It comes in agriculture only.

Student: Yes sir.

Animal husbandry also comes in agriculture. So, milk production is part of agriculture. Now, there is also increasing use of ICTs. The ICTs increasing use has been primarily in information flows in disintermediation, and on online trainer. Disintermediation was mediation was one of the things that they found as a problem in the existing APMC. So, they thought that they will use sort of technology to disintermediate.

Now, the favorite things that we talk in ICT is to use it for removing the long chain, reduce it, bring the farm, bring the seller and buyer together you know that is one of the approach scale also. The market operations very specifically we use some applications called e-tender, e-auction, it goes by different nomenclature basically performs the function of auction.

And second is releasing the discovered price you know when in the process of the auction you discover price. This price is released to multiple people through Whatsapp, through SMS, on the web etcetera. So, that people are aware what is the price at which a produce is being sold etcetera. The other thing in ICT enable trading. ICT enable trading we talk about is within the form of ump s you know unified market platforms, it could also be the online commodity exchanges. I spoke about both earlier itself. E-NAM is an

example of a online market LCD, EX, MCX, many of those commodity exchanges are examples of online commodity exchanges.

Now, what is happening because of the use of ICT is one observation is the markets structure is transforming, it is transforming very drastically. The physicality of the market is reducing. Physical is becoming virtual, the markets are becoming virtual and it is riding on the conversions obviously, the internet mobile as well as certain things that are happened other than agriculture online banking. Because online banking has become a very useful thing for making payments, transferring money, etcetera.

So, today there are state level unified market platforms, Karnataka is one of the pioneers in this. As of 2014, they started a market called REMS Rashtreeya, e-market. It is a joint venture between Karnataka government and NCDEX. Similarly, national e-market, e-NAM it is called that was 2016-17, it is in progress today, they are talking about bringing multiple states into it by 2020 etcetera. Then there are also multiple commodity exchanges, last time so there were about six.

These reforms and these ICT enable transformation on the policy and when they are stated their objectives and development of small holding farmers basically if a price information is supposed to empower the farmer. The e-tender discovers price efficiently there is no collusive behavior by the commission agent and buyer etcetera, which was one of the critics will be passed, so that has been taken care of kind of stuff. The UMP and exchanges allows people to reach, the farmer can reach multiple traders across India now. In the old APMC, it was only that that place if buyer comes, but now you can reach across the country, this is the narrative.

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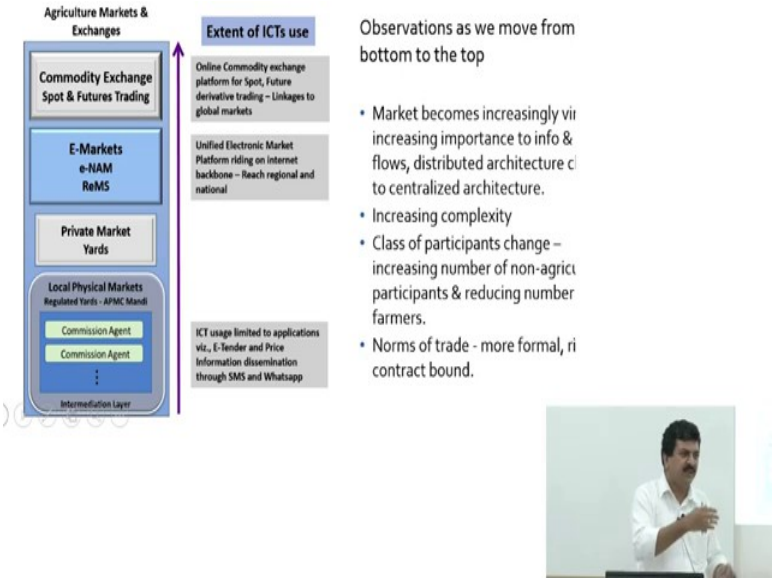

Now, you look at how it is actually planning out on the graph. The market structure has changed. So, I just start I will stack the marking somewhere, some logical way, and see how they look like. At the bottom I have the old market, it still continuous to exist. You have the private market yards, each opal and stuff like that.

You have the e-markets, e-NAM, the ReMS. I spoke about then you have the commodity exchanges. There is a logic to why I have put it up in this way bottom to top that is because of extent of ICT is going up as we look at the markets stack in this way. In the old market ICT is limited to certain point applications and also discrimination of price.

And as we go up, the unified market platform is having larger amount of IT, it is riding on an online platform. But as we go in further into the commodity exchanges, while the e-markets are limited to the state or to the country, the commodity exchanges have linkages to the global commodity exchanges. And the market is becoming virtual, more and more virtual as the use of importance to information is very high.

So, the example here the product has to be there for trading, how much product is there that trading can occur. So, there is in the commodity exchanges, you do not need to have to produce you just need to have a price. If you have the price of padding, you do not need to grow it. You can just start trading as long as you are a member of the commodity exchange.

So, the importance of the produce is coming down, importance to information is going up. And distributed architecture this is distributed you can have market in 30,000 to places. A single centralized architecture there is increasing complexity I think that is very visible. If you have ever tried working on the commodity exchange is trying to you know book some trading it is not very easy.

And the class of participants also changing, while here it is the we gave the farmers the small holder, any of these farmers who are in the game of farming really as you go up you feel they are reducing. They are getting replaced by speculators traders, people who look at farm produced more as a trading item rather than directly involved it could even be corporate who are working in that area.

The norms of trade also are in are changing. Whereas, here a large amount of trading skill happens in cash relationship oriented. In the upper part of the markets, it is very formal rigid and it is very contract bound. So, to trade an e-NAM or trading in the ncdex you need to a member to trade before you need to put in some EMD - Earnest Money Deposit. Your transaction is all on RTGS or any FD kind of transactions.

So, your understanding of banking, your understanding of internet may be even English, because some of the posters were available in Hindi, but they are not very easy to use. And your connectivity, while connectivity in the rural is good enough for me to make phone calls or may be exchange small messages you cannot hold a transaction link for very long it, it doesnt support. So, those are still some of the issues

Student: Where, where are these platforms (Refer Time: 25:33) from?

Internet.

Student: where are they, (Refer Time: 25:38)?

It is suppose to be available for farmers because that is how I can reach to the whole trading community in India, but it really has some of the those issues.

Student: Yeah, (Refer Time: 25:50) nothing to do that right.

I have a few slides that answers your question on the observation that you made. Yes, in the case of e-NAM there is certain amount of budget that has been set forth by the

Government of India for training the panchayat level offices office bearers as well as to extend it to the farmers. It is there the budget is there. The model is slightly different. The model is funding from the government for the application and for the training and stuff like that. The state government is suppose to adopt the operation cost. It is also that if the state government does not want to adopt an e-NAM, they are free to do. So, they may use their own market platform also.

Like in Karnataka, Karnataka does not you know adopt e-NAM. It uses REMS. And the e-NAM is actually structured on REMS in somewhere. The issue which comes in from the usage perspective, we will talk about it in few slides, but what does happen is large farmers, certain scale of farmers, certain scale of aggregators people who buy the agriculture produced for many people, they have ability to trade. There are certain norms like that. And the small farmers neither they have to be where with all to do so nor the transaction cost allowing them to do that. So, I move on and maybe I will answer those questions.

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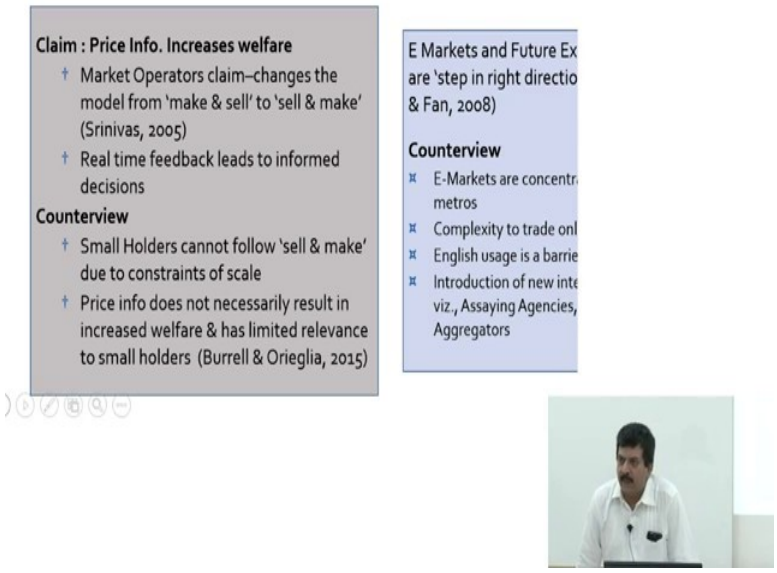

Student: How the transaction which is happening right now through these agriculture and markets, I mean not taking which is, but wherever the information technology is being used.

See the NEETI Ayog was talking about REMS as one of the successful this one. They are also talking about how it was made market efficient and all that. I think about 14,000

crores or something like that was traded on REMS I think so; e-NAM is still not in complete use by where.

Student: As the percentage (Refer Time: 27:54)

It is a very small percent, very small.

Student: Any reason growing infrastructure by the company to the farmers?

Student: especially the small farmers.

Student: how is that I think how is something using that for training and companies technology (Refer Time: 28:11).

See the there is a budget in the e-NAM for training people, they do workshops also. In fact, they circulate it through the panchayat level also. They fix certain days in the in a month or in a year, where the farmers can enroll and actually get training, very small amount of money you can get the training done.

They the interfaces also I was seeing the e-NAM and says they are all very nice interfaces, it is been built much better than the past this one. So, we are talking about two things here. One is e-NAM kind of usage which is primarily meant for agriculture market. And another is we are talking about the commodity exchanges where trading is happening for agriculture. These both we are talking about.

NCDEX, which is one of the largest derivative markets in India. They also have a wing very specifically to bring farmers into trading that is going on from 2012 onwards. But if you see the reports 2017 reports, etcetera, they are finding it very difficult to bring the farmers on the market platform. I think when I go through two or three slides more, the discussion can be very rumbled because some inputs I will be able to so yes.

We have been take that question of little later. This there they are really new age intermediaries are some of them are people who are in the agriculture sector, because they are having money, capital which is needed by agriculture sector, they are pumping in that money. And you know helping the sector in terms of exchanging the produce and converting it so. I will I will talk a little bit about it. Let me go through two three slides, some of the questions we will get answered.

Student: Sir, so I just want to understand these random (Refer Time: 30:08) farmers be registered by the APMC that is not possible.

Student: So, famers need register to the APMC?

In the case of REMS, it is run by through APMC only. In the case of e-NAM also the we can run it through APMC or they can run it without APMC, so that is not a it is not mandatory. APMC is not mandatory.

Student: So, what, what about farmers who are markedly you know take they produce to APMC and trying to?

They, they are they are what I call as farm gate sellers, you know the they sell informally. There are people who go and buy produce only farmers. If we go to a village, you see people who gathering a produce from many farmers and they buy it from them, and then they aggregate and take it to the buyer.

Student: So it (Refer Time: 31:04).

Many, yeah that is an another intermediation that we are talking about.

Student: It is an external person on that what is the designing pattern of it a which agencies farmer (Refer Time: 31:17) intermediate or the private market. So, is there any patterning that why the farmers knowing of taking panel is there any instruction in the (Refer Time: 31:27) as a partial (Refer Time: 31:29), and what is the level of technology introduction is made who actually use (Refer Time: 31:35) than that.

Student: Who is able to do work?

Student: Correct.

Student: They use large

Student: (Refer Time: 31:39).

You are all very eager I need two more slides to.

Student: (Refer Time: 31:44).

Answer all of your questions.

Bahubali 2, you will know the answer to why you know the guy was killed by any friend or whatever. So, I am trying to answer that in two slides ok.

So, now we are looking at areas that the stated objectives are all very nice, but we are looking at (Refer Time: 32:00) the transformation, and how it is being looked at from the small holder that side. I have taken a few claims and I am giving a (Refer Time: 32:08) look on that. One of the claim is that price information increasing its welfare. Now, that is what the narrative is. And also there is a lot of claim by the market operators by e-NAM and NCDEX etcetera that the change the model from make and sell to sell and make.

Typically in most of the sectors I go to the market understand what the market needs I come back come up with an idea and develop something, and then take it to the market because I know there is a demand for it. But in agriculture it works in a reverse direction. I grow something and then I go and find a buyer in the market. So, make and sell is the module that we use in agriculture. What the market is suggesting is sell and make, that means, go to market when you have a good price go and sell your produce, commit that in 3 months time, I will deliver your wheat or whatever make that future commitment, come back to your field, grow at wheat, make good your commitment, this is what is suggested.

Student: Is that possible?

We will talk about. Then another important is that price information gives real time information, feedback about how to make inform decision. When do I sell, a farmer can come to know it is in the price is going up, I will sell at discount at time. Now, this is the claim, but then there is a counterpart also which we if we have found out from some of the theory literature as well as from our own work. Small holders cannot follow a sell and make model.

The small holder cannot follow a sell and make model, because his holding size is so small that he only can grow certain type of things, he also has certain limits on the type of soil, the kind of water that is available. So, if I want to grow a high, high, high return crop I may not be able to do it because of natural conditions, I may not have access to

those seeds. I may want to grow kinuwa, because kinuwa is very expensive, but my land may not permit it, my weather will not permit it ok, so that is one of the reason why a make and sell is the model that is forward.

I grow what I know, I can grow in my land, it could be even coriander which has life you know shelf life of more than not more 3 to 4 hours in the market, but I still have to grow for you. Similarly, price information does not result in any increase welfare. Because the farmer who has grown something, he cannot hold it in his stock, and wait for the price to go up. He needs money he is short of cash. So, he as soon as he grown something, he goes to the market and sells. Second thing is also the perishability of the produced determines how to clear ok.

E-Markets and future exchanges are steps in right direction. This is a view which is coming in from the policy makers even the Government of India also. But there is also a counterview e-Markets are concentrated in the metros, at least the procurement points are in the metros. Even though everything is online, I still have a physical produce that I need to transport to a procurement point a godown or a warehouse and that is very far away. And there is complexity to trade online, it is not very easy to trade online ok.

It defeats many educates English speaking people. It can be tough I mean do not have access and practice on a day and day obtained. A farmers job is not to go on a market and speculate. His job is actually grows food better than trading ok. And in English, you say it is still a barrier Hindi, Kannada browsers are all there, but it is not very easy.

And introduction of new intermediaries comes into play. Here we spoke about intermediary is a different point, but there is also an intermediary which comes in online. In the online, there is no way I know about the quality of the produce. So, what happens is there is a new intermediary that we bring in called assaying agency. An assaying agency is an assessment agency which assesses a crop and grades it and says this is the quality of this crop on which basis an online bidder can put his price, buy it, so that is a new intermediary then there is also an aggregators.

Student: (Refer Time: 36:17) prevalent service a same agencies.

Yes, they are registered on the online market. Assaying agents make you go and give grades.

Student: (Refer Time: 36:27).

And select it. There are issues which are very similar to bringing the produce to the physical market. You have to take it to a point and if the assaying agency does not select your produce we have to rebag it and bring it back. You cannot sell at there, because they do not want to buy it. Then the online market requirements are put out, they have very limited expectation in this quality. It has to be this side it has to be this quality, it has to have so much you know you know whatever are the wage we assess the agriculture produce.

Then we also have another intermediary called aggregators. Since, all the small farmers cannot trade on the market directly, they have appointed aggregators. Now, these aggregators gather up to produce, aggregate them, consolidate homogenize quality may be graded and then bid in the market. So, you have some main intermediaries which is what was actually the purpose with disintermediation that part yeah.

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And another thing is and finally so now, I am just going to go into sum up this. The entry to e-Market is constrained to small holders that is what is our understanding. There are global geographical barriers. You have to move to the produce move to produce to the assaying agency or to move the produce to procurement point. There are biophysical limits. A farmer cannot go everything that he wants to go this is one of the understanding we have, and size of the land holding also limits the quantum of produced.

So, if I am producing let us say 1 tone of potato, I really do not have money to transport it 400 kilometers and sell in a market where I will get good price. I mean choose a market which is nearest and convert that produce into cash as quickly as possible. Then there is also high entry barriers in the e-NAM and in the NCDEX. The entry barriers is there, because there also some transaction process where a large trader does not want to buy from 200 farmers, one, one tone potato each. He wants to buy from one farmer 200 tones.

So, the large size is determined as the minimum large size that is fixed, product grade is fixed, because you are on online you cannot touch and feel. Agriculture produce works on touch and feel. So, you cannot do that. So, there is a product rate which limits certain people whoever can grow certain standard things, they can sell who does not grow that that produce cannot be sold.

And then there is also enforcement of contract I told you. Agriculture produce still is as been formal on cash and access to credit is also very important. To participate in some of these market you need to deposit, earnest money deposits you know it goes up to 5 percent sometimes, 5 percent money if I had I would even we are talking about very indebted people, poverty people, how can they come up with these kind of stuff. So, those are kind of things and it is not just the trending in India it is also finding by FAO in international one.

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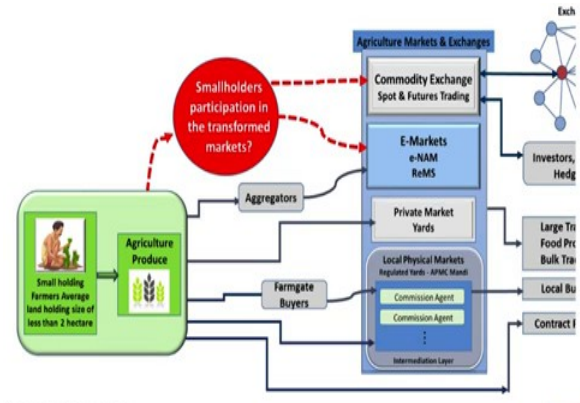

So, this is how the whole market looks like. Now, the farmer has direct access through the old market. He can do contract farming. He can also do trade work with (Refer Time: 39:39). But when he wants to go to the e-markets the ICT, the ICT ridden market; he really cannot reach there that question still he needs and that is where the inclusivity of design etcetera what we were talking about.

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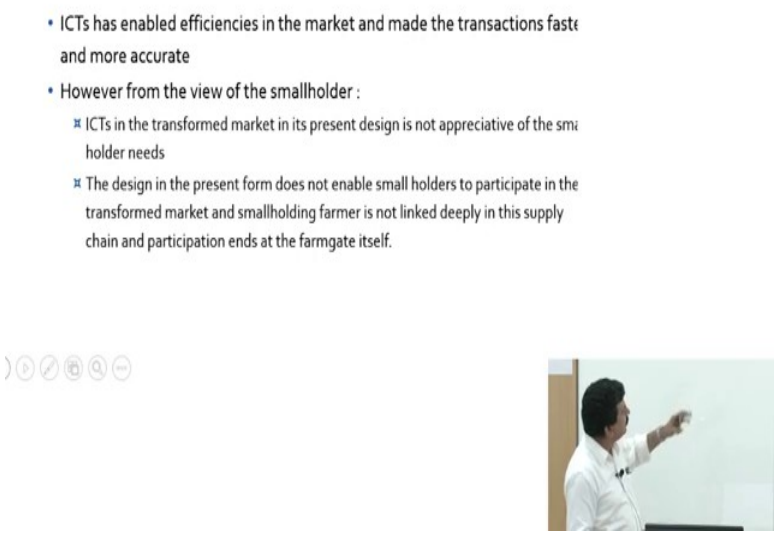

So, in conclusion what we are talking about is ICTs has enabled efficiencies in the market, it has made transactions faster. It has killed the distance, it has killed certain issues which were there in the olden days when traders do not reach all that kind of stuff it is taking care of. Transactions we have become accurate also, transparency is there in the auction process. But these will not close as benefits to the small holders that is the issue.

But from the view of the small holder what we are talking about is you need transfer market in the present design. It does not seem to be appreciative at the small holder needs. His needs are slightly different and being that they are different, in the present design he is not able to move that particular technology. And the design in this present form actually reduces the farmers participation from olden days to now, it actually reduces. In the older market at least you can go, you can see his produced being auctioned, he chooses what to do, what to not to do.

He has a satisfaction level his, his participation in supply chain in that market is little more deeper than in the e-market. In the e market he may have to sell it to the aggregator and at the farm gate, how different is it from the olden days when the when the APMC was not there. So, that is all we I leave there for you to think about it, what is technology done and what has technology not done in its present business.

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- Agriculture Census 2010-11, Ministry of Agriculture GOI, 2014
- Burrell, J., & Oreglia, E. (2015). The myth of market price information: mobile phones and the application of economic knowle ICTD. Economy and Society, 44(2), 271-292.
- Chand, R, 2017, Doubling Farmer's Income, Rationale, Strategy, Prospects and Action Plan, National Institution for Transforming NITI Aayog, NITI Policy paper No. 1/2017, Govt. of India, New Delhi
- Chand,R.(2012).Development policies & agricultural markets.Economic & Political Weekly,47(52)
- Chand,R. (2016).E-Platform for National Agricultural Market. Economic & Political Weekly,51(28),15-18
- FAO, 2013, Smallholder Integration in changing food markets, UN Publications, Rome
- FAO, 2015, The State of Food and Agriculture 2015 – Meeting the 2015 International Hunger Targets: Taking stock of uneven prc UN Publications, Rome.
- Jan, M. A., & Harriss-White, B. (2012). The Three Roles of Agricultural Markets. Economic & Political Weekly, 47(52),
- Kumar, R. (2016). Rethinking revolutions: Soyabean, Choupals, and the changing countryside in Central India. Oxford University
- NSSO, 2013, Ministry of Statistics & Programme Implementation, Govt. of India, New Delhi
- Rajib, P, 2015, Indian Agricultural commodity derivatives market – In conversation with S Sivakumar, Div Chief Executive, Agri Bu Div, ITC Ltd., IIMB Management Review (2015) 27, 118-128
- Sahadevan, KG, 2012, Commodity Futures and Regulations, A Vibrant Market looking for a powerful regulator, Vol XLVII, N Economic & Political Weekly
- Sharma, AK, 2015, Transformation in Indian Agriculture, Allied Sectors & Rural India: Is there less krishi in Bharat? NCAER,New D
- Srinivas, NN, 2015, Five Benefits farmers seek from the new national market for agriculture, ET, May 3rd, 2015
- UNCTAD (2015), Commodities and Development Report 2015 – Smallholder Farmers and Sustainable Commodity Develop UNCTAD Publication.
- United Nations (2015) Resolution A/RES/70/1 "Transforming our world: the 2030 Agenda for Sustainable Development", I Nations Publication.

Some references that I have used. Thank you. I am looking for this. (Refer Time: 41:32) lot of time.