Commodity Derivatives and Risk Management
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Lecture 31
Agricultural Commodity Price Risk Management

Welcome to the 31st lecture on Commodity Derivatives and Risk Management. And today we are going to discuss various aspects of agricultural commodity price risk management. Please note that the earlier sessions, we have kind of a given equal emphasis to a commodity derivative trading aspects both in Indian market as well as international market. But considering today's session and the coming next 2 to 3 session we are going to be discussing agricultural commodity price risk management. Predominantly we will be focusing on the Indian market, we will of course, discuss some concepts related to the international market, but predominantly these 2 to 3 sessions are going to be focusing on different aspect of Indian Agri commodity risk management system. Now, let us understand what the Indian agricultural market in a glance. So, as you know that agriculture and its allied sectors is the largest source of livelihood in India. In fact, 70 percent of rural household which depend primarily on agriculture and 82 percent of farmers in India are small and marginal farmers. And what do we mean by marginal or a small farmer? As per the Reserve Bank of India guideline, marginal farmers are those farmers who farm size is up to 2.5 acres and small farmers have a farm size up to 5 acres. And even though India has a predominant proportion of farmers which are categorized on the marginal and a small farmer category, India has attracted the very positive distinction in terms of being the largest producer of many Agri commodities such as milk, jute, pulses. India is the second largest producer of rice, wheat, sugarcane, cotton, ground nuts and in-land fish, potatoes, onions, cauliflower, brinjal and cabbage as well as many other Agri commodities. And among fruits, India is the largest producer of banana, mangoes, guava, and papaya. And in this context of Indian agriculture, it is very important to know that around 3 million people died during the Bengal famine which lasted during 1941 to 1943. And please note that the real cause of the drought and famine, the real cause of this particular death was not the actual drought or famine, but the Churchill's inhuman policy contributed to the 1943 Bengal famine. In fact, in earlier sessions or in future sessions, I will be mentioning about lot of weblinks as part of my presentation, but I would urge each of you to definitely go through these two weblinks which is given below to understand how Churchill's inhuman policy contributed to a I mean unbelievable amount of death which is around 3 million Indian people died. Now from that day, India has come a long way in terms of fruit production as you know we just discussed India is the largest producer of many of the Agri commodities. And India governments, the government of India's focus since the independence has led to the

massive amount of increase in production of many of the Agri commodities. And India has focused on better irrigation practices, usage of improved seed yields, better transport links and improved food distribution and welfare system. So, India has progressed significantly on many of these parameters. However, what remains almost constant is the farmers' risk. Farmers in India get very little amount for what they produce, and farmers are in very dire straits. Now, let us understand the different types of risk faced by the farmers. In Indian case, Indian farmers face many difficulties which are like lack of warehouse and cold storage facility, lack of quality assessment and grading infrastructure and more importantly access to competitive market these are the most important causes. And in this context, I would like to draw your attention to an article which was published by the Times of India on February 24, 2023. And this particular article in fact, drew significant amount of attention related to the plight of Indian farmers. This article showed the Maharashtra farmer, a particular farmer his name is Mr. Rajendra Tukaram Chavan who is a 58-year-old onion farmer from Maharashtra-Solapur district. He travelled 70 kilometers towards Solapur APMC. APMC stands for Agricultural Produce Market Committee. We will be discussing more about the role of APMC in Indian Agri system. So, this particular farmer Mr. Chavan travelled 70 kilometer and sold 512 kg onion and finally, he got a cheque of rupees 2. Please note that he sold onion at a price of 1 rupee per kg. So, 512 rupees he received, but after deducting whatever your quality assessment owing and some of the market fee structure related to APMC finally, he is going to get a cheque of 2. In fact, this is the picture of the total calculation. I hope you will be able to see this in case you are not able to see I want you to I mean you can visit this particular link and you will be able to get more about this in about this particular event. And you will also be very saddened to see that 5,563 farmers have died by suicide in the year 2021 alone. This is the National Crime Records Bureau report. So, what I am drawing to your attention is that though Indian farmers have been doing a commendable job in terms of the quantity of production, but Indian farmers face significant amount of price risk, they do not get a proper remuneration for the kind of Agri farm produce they produce. Now, let us understand what has been the traditional risk management avenues for Indian farmers. Indian farmers have been able to certain extent they have been able to mitigate the quantity risk as well as the price risk. So, what do you mean by quantity risk? Quantity risk is defined as an inadequate production quantity due to adverse weather condition or a crop damage due to pest infestation. So, price risk is different than the quantity risk. In case of a price risk the farmer is able to produce good amount of Agri commodity but is not getting a remunerative price. In case of a quantity risk farmer itself is not able to produce enough quantity because of adverse weather condition or a because due to because may be due to crop damage because of the pest infestation. And let us understand how farmers have been able to manage the quantity risk not to a great deal, but some farmers have been able to mitigate the quantity risk by entering into different kinds of insurance programs. So, at different point in time government of India has

offered different kind of an insurance programs to Indian farmer. So, in fact, India has a very long history of crop insurance. Some of the important crop insurance scheme by government of India is a comprehensive crop insurance scheme in the year 1985, National Agricultural Insurance Scheme in the year 1999, Varsha Bima 2005 and Pradhan Mantri Fasal Bima Jojana in the year it started in 2016. And more details about this Pradhan Mantri Fasal Bima Jojana are available on this website. We will also be very briefly discussing about this aspect in the next coming 2 to 3 minutes. Now, coming to price risk, price risk has been mitigated by Indian farmers by entering into contract farming agreement or the minimum support price offered by the government of India. But these 2 programs have given some benefit to the farmer, but this has not enough for farmers to mitigate the prices. And as you can see that many farmers commit suicide, many farmers receive very negligible amount of money for the farm produce, and this gets manifested as the price risk. So, in addition to this traditional way of mitigating the risk through contract farming or minimum support price offered by the government of India, very recently commodity derivative exchanges in India have been able to support farmers by offering many derivative contracts on agricultural products. So, in these sessions today's session and the next couple of sessions we will be focusing more on the price risk management aspects by Indian farmers. Now coming back to this Pradhan Mantri Fasal Bima yojana, I have taken the snapshot from this website exactly if you visit this particular website, you will be able to get to see something called an insurance premium calculator. This is just some random data I have taken in terms of the season is Kharif season, year is 2023 and as part of the Pradhan Mantri Fasal Bima yojana, if a farmer is belonging to a Jammu-Kasmir region let us say Pulwama district and the farmer is producing a maize and an area of plantation which the farmer is undertaking is let us say 3. If this detail is given this particular output comes out from this insurance calculator as you can see the insurance company is agricultural insurance company, this is the company which is providing the insurance to the farmer and what is the sum insured per hectare that is your 59,500 and the actuarial rate is 21 percent. So, what is this 21 percent or what is the actuarial rate? The actuarial rate indicates the amount of premium the insurance company must receive to assume the risk as we have discussed earlier also all insurance contracts are basically your put option contracts. So, the farmers pay premium and transfer the risk to an insurance company in this case the insurance company which will be assuming the risk that is the agricultural insurance company and in case of a loss happens total amount of some insured is going to be 59,500 rupees per hectare and this actuarial rate is coming to your 21 percent. So, this 21 percent is the minimum amount of insurance that should be paid by the buyer of the insurance. So, the insurance company will be taking the risk through that process as you can see. Out of this 21 percent of actuarial rate farmer will be only paying 2 percent and the rest 19 percent will be borne by the government of India. So, based on this calculation as you can see if a particular farmer is producing maize on 3 hectares of plant the farmer has to pay 3570 rupees as the

premium and the government is going to pay 33915 rupees as the premium and for a total sum insured of 178,500 which is nothing, but 59,500 per hectare into multiplied by 3. So, by providing this financial support government of India is able to help farmer to mitigate the quantity risk. In fact, all farmers almost all state government farmers are encouraged to avail this opportunity because government of India takes a bigger responsibility in terms of the premium component as you can see in this case only 3570 rupees has to be paid by the farmer and the government will be paying 33,915 rupees as a premium. Now coming to the traditional method of mitigating the price risk which is available to Indian farmer that is your contract farming. So, what exactly is contract farming? In a contract farming arrangement, a farmer or producers enter into a forward contract with a buyer and the buyer is normally a company. Let us take some examples of contract farming. In fact, one of the most successful contract farming arrangements in India has been done by the PepsiCo India Limited. This PepsiCo India was the first corporate to introduce collaborative farming for potatoes in India in the year 2004 to 5 and PepsiCo worked with farmers of many states such as West Bengal, Maharashtra, Punjab and UP and as part of this particular contract farming arrangement farmers will be producing potato and PepsiCo bought the potato at a pre agreed price. Even before the farmers start planting the potato the farmer group and PepsiCo kind of a enters into an agreement and where PepsiCo agrees to buy the potato at a pre agreed price and by doing so, PepsiCo kind of a insulates the farmer from the open market price fluctuation. In addition to buying the potato at a pre agreed price PepsiCo also supplied planting material as well as advanced seed varieties that also supported farmers with technical know-how. Here in this context, I would like to tell you that a farmer producing any type of potato, or any variety of potato may not be acceptable to PepsiCo for whatever purpose they are buying potato. So, PepsiCo also gives the kind of seed the farmers should be using to produce the specific type of potato PepsiCo would be interested in buying. In addition to providing seed varieties PepsiCo also supports farmers with technical know-how to farm, when to plant, how much water to be given, what should be the soil condition and so on so forth. And as part of this particular contract farming arrangement, PepsiCo also incentivizes farmers to start drip in irrigation and water conservation which is a very commendable and very interesting aspect of this contract farming. And also facilitated farmers to take crop insurance to protect the farmers from quantity loss. This is also a very important part of a contract farming agreement because unless the farmers are able to produce this PepsiCo will not be able to buy it. So, the first and foremost thing is that the farmers must produce the desired quantity of potatoes. And if they are not able to produce PepsiCo will not be able to pay money for that. And in that case farmers will also be facing a significant amount of financial loss. So, to avoid that kind of a situation PepsiCo also facilitated farmers to take crop insurance to protect the quantity loss. And another very interesting and successful story with respect to contract farming is related to the India's farmer farming cucumber and gherkins. In fact, India has emerged as the largest exporter

of cucumber and gherkins in the world done mostly through contract farming arrangement. More details about this particular initiative are available on these two websites. In fact, if you give a web search related to cucumber hurricane export by India you will also be able to get many interesting aspects related to the contract farming arrangement and how this particular contract farming arrangement is able to help farmers. Now with this particular slide we will also be discussing the downside of contract farming. Contract farming has helped companies as well as the farmer, but can there be some downside to it? The answer is yes. Please note that the contract farming promotes large monoculture farming. So, if PepsiCo wants to buy a potato a lot of farmers will only be producing potatoes, and they will forget the skill set to produce other Agri commodities which traditionally they have been producing. So, contract farming promotes large monoculture farming and dependency of farmers on companies for seed and farm equipment. So, farmers depend completely on the contracting company for farm for seed and farm equipment basically by doing so, they lose out the skill set other skill set related to buying the raw material understanding the skill set required to farm other Agri commodities. And contract farm farming companies has been you know they have given lot of preferential treatment to large farmers, and they have neglected small farmer. Even if as part of the contracting agreement they have entered into both large as well as small farmers, but the contracting company normally gives preferential treatment to large farmers. And contracting farms also exploit the situation because they are in a monopsony situation means it is a single buyer. Please recall in the earlier couple of sessions we have discussed about difference between monopolistic or monopoly market situation as compared to monopsony situation. So, in this case by entering into a contract farming arrangement the farm becomes a single buyer with many sellers and hence enjoys a monopsony situation. And when any anybody is either a monopoly or monopsony situation that particular party normally exploits the other party and in this case many a times farmers have complained that the contracting party pays a lower price to the farmer because farmers have the low bargaining power and how the contracting company does or offer a low price, they do undue quality cut on the produce. So, when a farmer brings the produce to the contracting companies farm gate the quality assessment team of the company says that your production is of not up to the quality and they reduce significant amount of money because the quality is not up to the mark. So, undue quality cut on produce and asking for delayed delivery at the factory gate. So, they would be informing the farmers which day you should bring your produce to the farm gate. So, till such a time the farmer has to make arrangements for storing the underlying commodity at some other warehousers go down. So, that also creates a lot of stress for the farmer. So, asking for delayed delivery at the farm at the factory gate is one of the downsides of the contract farming arrangement and many a times the contracting farm also delays the payment after receiving the Agree commodity from the farmer it will be not making a prompt payment it will delay the payment. So, these are some of the issues which have

been highlighted by farmers as part of the contract farming agreement. So, from the contracting company point of view if you see that there is a lack of enforceability of contractual provision which can result in breach of contract by either party. So, many a times what the farmers in India that have done, they have produced the goods they have gone ahead and sold the produce to somewhere else because they have received a better price for it and not deliver the underlying commodity underlying good to the contracting farm. So, both parties have an equal chance of you know breaching the contract agreement. So, that is the downside also of contract farming. Another important aspect also contract farming in India is limited to few Agri commodities. So, even if contract farming has been able to help some Indian farmers to mitigate the price risk, but contract farming is only limited to few Agri commodities not all Agri commodities produced by Indian farmers are part of the contract farming arrangement. Now coming to the second aspect of the traditional price risk management offered by the government of India which is known as your minimum support price or MSP. And minimum support price is the price at which government purchases crops from the farmers to safeguard the interest of the farmer. So, basically MSP is a long-put option by the farmer and of course, short put option by the government of India. Please note that the farmers have the right to sell if the farmers decide not to sell, they will not be selling, but if they are not getting any better price anywhere else other than the MSP, they can bring their firm produce to the government of India approved agency and they will be able to sell the underlying commodity to the government of India. In this context, please note that in the year 1955 government of India enacted an act which is known as an essential commodity act and this act control the production supply and distribution of many Agri commodities with the objective of making these commodities available to consumers at a reasonable cost. As long as a commodity is part of an essential commodity act government has a significant power in terms of how much of what will be the price, who will be able to hold, what amount of underlying how much one particular trader or wholesaler will be able to hold the underlying commodity all things related to that particular commodity will be under the purview of the government of India. And this particular act was primarily enacted to prevent food commodity stockpiling, hoarding and black marketing by wholesalers and traders as India was facing severe food crisis during early part of the independence. And this act also authorizes the government of India to set the minimum support price for essential commodities. So, as part of this particular act government of India will not only be identifying which particular commodities will be part of the essential commodity and will also be able to set the minimum support price for these commodities. And minimum support price is announced by the government of India every year and based on a recommendation by a body which is known as your CACP or commission of agricultural cost and prices. And this based on CACP recommendation minimum support price is announced by government of India for Rabi crops as well as a Kharif crops. So, what do you mean by Kharif crops? Kharif crops are those crops which

are grown during monsoon season. So, which are basically ground nut, paddy, maize, urad Arhar. Rabi crops are mostly grown in winter season wheat, mustard, soybean, moon etcetera. And commission of agricultural cost and prices, CACP considers four important factors before it recommends a price for the MSP for a given year. And what are these four factors? CACP considers the cost of production, changes in input output prices, market price in the previous year as well as intercrop price parity. So, these are four factors which have been considered by CACP to arrive at the MSP. And once the government of India accepts the MSP and makes an announcement when a particular farmer will be bringing the Agri produce, it will be bought by approved authorized agency of government of India. These are the four authorized agency of government of India which buys different kind of a Agri product. So, these are your food corporation of India, cotton corporation of India, jute corporation of India and NAFED. So, FCI mostly buys paddy, rice, wheat etcetera. And cotton corporation buys cotton, jute corporation of course, buys jute and NAFED buys all other products related to different kind of your pulses. So, with these we will come to an end of our today's discussion. In today's session we discussed about the different types of risk faced by the Indian farmers which is namely the quantity risk and the price risk. Quantity risk is predominantly mitigated by entering into various kind of an insurance contract and to promote farmers or to encourage farmers to enter into insurance contract, government of India also becomes a co-sharing body for paying the insurance premium. And coming back to the price risk management system, traditionally contract farming or minimum support price has been used by farmers to mitigate the price risk. With this we will come to the end of today's session. We will be discussing the remaining part of agricultural commodity price risk management aspect in the subsequent section. And I eagerly look forward to interacting with all of you in the next session. Thank you all of you.