

- Episode 45 –

AI and Agriculture

A Smart way of Farming

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Agriculture or farming is one of the most primitive and significant professions worldwide. However, farmers are mostly struggling to manage threats to their crops against disease and pests, which is made severe by climate change, monocropping, and prevalent pesticide use. Due to encroachments, farming land is also reducing day by day. This results in a wide gap between demand and supply causing severe problems of food security.

This episode describes how farmers can overcome all these threats by using the AI-powered technologies. It also talks about how farmers in India are also adapting this smart way of farming.

List of Characters :

Nagesh : A farmer (age about 45 years)

Daji : An old farmer (age about 70 years)

Keshav : A college going boy (age about 17-18 years)

Bhima : A farmer (age about 40 years)

Banu : Bhima's wife (age about 35 years)

(Scene of a village. Nagesh, a farmer is sat under a large banyan tree in a village. So sounds of birds, some cattle, kids are required to use to create the outdoor ambiance of the village life. Nagesh is reading the newspaper. An old farmer Daji comes to him.)

Daji : *(Calling Nagesh in an upper tone. Palpitation in his sound is felt as he came walking)*
Nagesh, o Nagesh.....

Nagesh : Namaste Dajiba.... How are you? I haven't seen you for the last few days!

Daji : *(In weak, frustrated sound)* Hmmm.... You are right Nagesh! Now I am 70 years old... the health is not supporting!

Nagesh : Come on Dajiba! Don't get frustrated. You are still fit and fine.

Daji : Why are you showing unnecessary hopes, Nagesh? It is now becoming difficult for me to work. And you very well know the situation of farmers... It is getting worst day by day! Our hard work is not fetching enough earnings for us...

Nagesh : Dajiba, what you are saying is correct. Even in the newspaper, the news also is saying the same!

Daji : Means?

Nagesh : Dajiba, listen. I am reading for you.... *(Starts reading some headlines in the newspaper)* Thousands of tones of grain get wasted every year in godowns....70 percent of onion crop is lost due to heavy rains...

Daji : Hmm... Sometimes rains are scarce and we face drought situations... and sometimes it rains so heavily that the entire crop gets washed off.

Nagesh : You are right Dajiba! But what can we do for it? We just have to bare with this situation and hope for the best.

Daji : Hmm.... god only knows what will happen in the coming days!

(At this point of discussion, Keshav, a college student enters in the scene)

Keshav : Not only god, but I also know what will happen in the coming days!

Nagesh : Ohh, Keshav! When did you arrive here?

Keshav : Nagesh uncle, now its vacation time for me. Our exams are over in last week... so immediately I came back home!

Daji : Nagesh, with whom you are talking?

Nagesh : Dajiba, he is Keshav. Son of Sudesh Patil.

Daji : Hmm.

Nagesh : He is doing engineering in the city college. He stays there only... in the hostel. Since he has finished his exams, he came back home.

Keshav : Namaste grandpa!

Daji : God bless you son! But what you were talking about? Something like – ‘You also know, what the god is knowing....’ I did not understand!

Keshav : ***(laughing)*** Grandpa, I mean to say, we can find the solution to all problems which you were discussing... and if we have solutions to these problems, our future is bright!

Nagesh : Keshav, are you kidding?

Keshav : No Nagesh Uncle.... I am seriously talking.

Nagesh : You mean to say, we can overcome the issues of food storage, draught conditions, changes in weather conditions such as uneven rains...

Keshav : Yes, certainly!

Nagesh : Keshav, how can you govern weather conditions? Rainfall is not in our hand... when it will arrive, how much will it be...

Daji : Beta, don't be under the impression that, you are learning in a big city means you know everything and you can do anything.

Keshav : No, grandpa....I did not mean it.

Nagesh : Then, what you want to say, Keshav?

Keshav : Nagesh uncle, Grandpa... see the problems are there. Everybody knows. But we can find solutions to these problems.

Nagesh : So, you mean to say you can have a solution to changing weather conditions?

Keshav : Yes, certainly. But not the way you are thinking. Nobody can change weather conditions, but we can change ourselves ... we can change our processes according to weather conditions.

Nagesh : *(Sarcastically)* Keshav, it seems your teachers teach you magics in the college! Or do you have any 'magic stick'?

Keshav : *(curiously)* means?

Nagesh : I mean it, Keshav! Otherwise you did not have said about changing ourselves or changing our processes.

Keshav : *(laughing)* Nagesh uncle, let me elaborate on my point, and then it will be clear to you.

Nagesh : Okay.

Keshav : In the hostel where we stay, I and my friends have potted some plants. Now all of us are in their native places. Nobody is residing at the hostel. So the question is who will water the plants for the next two to three months?

Daji : Hmmmm....

Nagesh : You must be having a caretaker or watchman for your hostel... you can tell them....

Keshav : Yes, that is one way of solving our problem. But how can we guaranteed that the watchman will water our plants regularly for the next two to three months?

Nagesh : You can ask them on the phone...

Keshav : Okay. If I ask them on the phone, whether they have watered our plants or not and they said 'no' then? Otherwise, we have to pay them for this job, then we can ask them why are they irregular in watering the plants.

Nagesh : Correct.

Keshav : But we have a smart way to do all these things!

Nagesh : Smart way?

Keshav : Yes, a smart way! I can water my plants as and when I wish... and I can do it from here!

Nagesh : *(Surprisingly)* How is it possible? From here?

Daji : Beta, this is not a good habit to make fun of elder people!

Keshav : Grandpa, I am neither making fun nor I am joking! We are practicing it.

Nagesh : I don't believe, Keshav!

Keshav : Nagesh uncle tomorrow I will show you how it is possible. But, for that, you have to come to Bhima uncle's farm!

Nagesh : Why?

Keshav : Because, I have installed this system on an experimental basis in Bhima uncle's field. Some minor things I have to complete and by tomorrow I can finish them.

Nagesh : Ohhh...that's great!

Keshav : So tomorrow morning we will meet at Bhima uncle's field.

Nagesh : Sure!

Keshav : But there is one condition!

Nagesh : Condition?

Keshav : Yes!

Nagesh : Which condition?

Keshav : You have to bring Grandpa also along with you!

Nagesh : (laughing) Yes, by all means!

Grandpa : Beta, I will surely come tomorrow to see your magic! (laughs)

(Change over music piece)

(A scene of Bhima's field. Sounds of various birds are heard in the background. Bhima and his wife Banu are already present in the field. They are waiting for Keshav, Nagesh, and Daji to come)

Banu : Are you sure, Keshav will be coming today?

Bhima : Yes Banu. Yesterday he called me and told me that today he will be coming here along with Nagesh and Daji.

Banu : Yes, it's okay, but how long we have to wait here? We can proceed for our work.

Bhima : *(with joyful voice)* Banu, see... Keshav is coming with Nagesh and Daji.

Banu : Thank god! Without Keshav we cannot start the water pump!

Bhima : Don't worry Banu. He will explain to us.

(Keshav arrives at Bhima's farm along with Daji and Nagesh)

Keshav : Sorry Bhima uncle for the late, but we are coming with Grandpa today!

Bhima : Namaste Dajiba.... Namaste Nagesh!

Daji : Namaste. Keshav insisted me to visit your farm... so I came here!

Banu : We are pleased to see you Dajiba! It's our fortune that you have come to visit our farm.

Daji : Hmmmm... Banu, one thing is sure....

Banu : What Dajiba?

Daji : Your husband... Bhima is a very hard-working farmer... and it is his fortune that he got wife life you!

Nagesh : Correct! Dajiba, you are absolutely right.

Keshav : Okay... Now Nagesh Uncle, Bhima Uncle, and Grandpa.... Listen to me.

Nagesh : Yes...

Keshav : Now, we are more than five hundred meters away from the switch of the water pump. But from here I can start now the pump... See!

(Sound of keypad notation of mobile and then the sound of the water pump is heard)

Banu : Wow! That's great!

Daji : This is magic!

Keshav : (laughing) Not at all a magic, grandpa! We all know that, we can operate our television with the help of remote control from a certain distance....

All : Yes! Yes!

Keshav : This is a similar technique to that! I have placed sensors and signal receivers. They can identify the commands which I give through this app using my smartphone and accordingly start functioning.

Nagesh : Ohhh!

Keshav : But there is something more I have to share with you!

All : What?

Keshav : We can make this water pump stop automatically when each section of the field receives the desired quantity of water. The sensors which I have installed, measure the humidity and temperature of the soil. We can set parameters here in the mobile app and then...

All : Then?

Keshav : (laughing) then just forget! The app will take care of everything! It will also notify you about the status timely. Moreover, you can set the timing. So the pump will start automatically at that time.

Daji : Now, I have understood.... The same thing you have done to water plants at your hostel!

Keshav : Correct, Grandpa! We can set the time and frequency of watering and the system will work on its own!

Daji : It's like setting an alarm in the clock, right?

Keshav : Correct, Grandpa! Now you got my point. So technology will now help us to solve our problems. The only thing is we need to use it properly.

Nagesh : It's amazing!

Bhima : Yes! I liked this Keshav! I don't require to ask Banu now and then whether she has started and stopped the pump or not!

Banu : Hmmm.... You are talking in such a manner that I am lazy and workshy!

Bhima : No...no! Banu, I did not mean it!

Daji : Hmmm.... Now Bhima, you have to make up the mind of your wife, at home!

(All laugh)

Bhima : But... Keshav, we all liked what you have done!

All : Yes!

Keshav : This is not rocket science. Worldwide, agriculture has become a big industry...

Daji : Hmmm.... and we are doing the same old things, years after years!

Keshav : Yes, Grandpa! This agricultural industry is turning to artificial intelligence technologies to help yield healthier crops, control pests, monitor soil, and growing conditions.

Nagesh : Keshav, what you have said? Artificial...

Keshav : Artificial Intelligence! That means machines think like we do and they take decisions on behalf of us!

Bhima : Ohhh... that's great! But, do they take correct decisions?

Keshav : (laughing) Bhima Uncle, it is after all in our hands. How we programmed these machines is important. Ultimately, they follow what we have asked them to do, but they analyze the situation as per the given programme and take correct decisions.

Nagesh : But Keshav, what do these machines analyze?

Keshav : Nagesh Uncle, farms produce hundreds of thousands of data points every day. With the help of Artificial Intelligence, farmers can now get a lot of data in real-time such as weather conditions, temperature, water usage, or soil conditions. On analyzing the data, Artificial Intelligence technologies help farmers optimize planning to generate more bountiful yields by determining crop choices, the best hybrid seed choices, and resource utilization.

Nagesh : This is very good. It means the technology will now help us to improve harvest quality.

Keshav : Not only quality but precision as well!

Bhima : Precision? How?

Keshav : Precision agriculture uses Artificial Intelligence technology to aid in detecting diseases in plants, pests, and poor plant nutrition on farms. Sensors can detect and target weeds and then decide which herbicides to apply within the right buffer zone. This helps to prevent over-application of herbicides and excessive toxins that find their way in our food.

Banu : That will save our lot of money as well!

Keshav : Yes, absolutely Banu Bhabhi.

Nagesh : Keshav, a short while ago, you have talked about the weather.

Keshav : Yes!

Nagesh : Can this system help to forecast weather conditions?

Keshav : Yes, absolutely Nagesh Uncle! Using Artificial intelligence seasonal forecasting models can be created to improve agricultural accuracy and increase productivity. These models can predict upcoming weather patterns months ahead to assist the decisions of farmers.

Nagesh : Like local weather conditions, another challenge that we are facing is about labour. Now a days nobody likes to become a farmer or work on the farm.

Bhima : Yes, Nagesh is correct! Many families have migrated to cities from our village. And if this continues then there will be hardly anybody left for farming.

Keshav : Bhima Uncle, Nagesh Uncle, unless our farming becomes profitable, no one will turn to this profession. So whatever you are saying is a genuine problem.

Daji : But is there any solution to this problem?

Keshav : Traditionally farms have needed many workers, mostly seasonal, to harvest crops and keep farms productive. However, we have moved away from being an agrarian society that is with large quantities of people living on farms to now large quantities of people living in cities. So with less people entering the farming profession, most of the farms are facing the challenge of a workforce shortage.

Banu : Yes... but what can be the solution?

Keshav : Bhabhi, one of the solutions to overcome this shortage of workers is Artificial Intelligence agriculture chatbots.

Banu : Meaning?

Keshav : A 'bot' or 'chatbot' is a short form 'chat robot'. It is a computer program that simulates human conversation, or chat, through artificial intelligence. More importantly, this conversation or a chat with a user takes place in natural language through messaging applications, websites, mobile apps, or even through the phone.

Nagesh : But how it will help to overcome the shortage of labour?

Keshav : These bots augment the human labour workforce and are used in various forms. These bots can harvest crops at a higher volume and faster pace than human laborers, more accurately identify and eliminate weeds, and reduce costs for farms by having a round the clock labour force. These bots organize data for farmers, help with the workload, and improve a wide range of agriculture-related tasks in the entire food supply chain.

Bhima : Is it really possible?

Keshav : Yes, Bhima Uncle! It is being used. In fact shortage of labour is an universal problem. But thanks to artificial intelligence which allows farms of all sizes to operate and function keeping our world fed. Through the use of agricultural artificial intelligence and cognitive technologies, farms across the world are able to run more efficiently to produce the fundamental staples of our dietary lifestyles. Now drones are also being used in agricultural practices.

Nagesh : Drones?

Keshav : Yes, drones! With the help of flying drones in the sky, Artificial Intelligence enabled cameras can capture images of the entire farm and analyze the images in near-real-time to identify problem areas and potential improvements.

Daji : People in other countries might be using this... but what is about our country? Do we have such kind of technology?

Keshav : Why not Grandpa! Farmers in our country are also using such technology. Our government has started using Artificial Intelligence in the agriculture sector.

Daji : Our government?

Keshav : Yes! The Indian government has begun the use of Artificial Intelligence on pilot basis for crop cutting and yield estimation under its flagship scheme “Pradhan Mantri Fasal Bima Yojana”. The move is aimed at cutting down the cost of farming while increasing productivity. It is also aimed at ensuring better prices for farmers.

Nagesh : This is a very good initiative from our government.

Keshav : Yes... and all the farmers should take advantage of it.

Bhima : Keshav, you are correct. The traditional farming practices in the country since ages has resulted in low yields and excessive dependency on monsoon rains. The failure of monsoon in the country has often resulted in failure of farming and suicides of farmers. But the use of technologies like Artificial Intelligence will help farmers.

Keshav : Several Indian farmers have started using digital tools to decide which crop to grow and also for selecting pesticides and fertilizers. Several start-ups are also engaged in developing technologies that will be used by farmers to improve their productivity. Artificial Intelligence may help to reduce the cost of production through the precise application of agricultural inputs like fertilizers, chemicals, pesticides, irrigation, etc.

Bhima : So automatically it will increase the income of farmers!

Keshav : Yes! Our government is trying to double the income of farmers and artificial technology will play a very important roll in it.

Banu : Yes, Keshav... I also should have to play my role now!

Keshav : What do you mean Bhabhi?

Banu : Just see in your mobile phone... what is the timing! It's time to take lunch now!

All : Yes!

Nagesh : Actually, we engrossed in the conversation and the information –

Bhima : Yes... Keshav gave very important information! Now we all will spread this message in the entire village and will start farming with technology.

Nagesh : It will be a new beginning!

Banu : Yes... but we all will first have lunch. I have brought roti and sabji. Will sit under the mango tree there and have lunch now!

All : Yes! Let's move!

(Music piece. Episode ends)

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