

Episode-25

Global warming and food security

Script Written:- Dr. Suresh Bhagwat
Translation: Smt. Savita Yadav

Character:-

Dad: Middle aged father age about 45 years.
Mom: Working mother, age about 40 years.
Pratik: School student about 12 years.
Pranali: School going, age about 14 years.
Ramesh uncle: A friend of father about the same age.
Ramesh's wife Radha

Venue : A middle class home, Mom is in the kitchen and children are playing in drawing room.

Starting music

Music fades

Daddy returns home.

Daddy: Hello everybody, I am home! But where is everybody?

Pratik: Dad we are in the kitchen helping Mom to make lots of fruit jam.

Daddy: Well, I think I should come and join too.

Daddy enters the kitchen.

Pranali: Hi Daddy, see mom has bought so many fruits, she was saying once the rains begin, fruits and vegetables will be scarce. Can tell me why? I thought rains are good for everyone.

Daddy: You are right, rains are good for everyone, but so much depends upon how rains are distributed during the season. Rains not only influence availability of fruits and vegetables but our food security is dependent on it.

Pratik: What is food security, Daddy? Does it mean guarding our food?

Daddy: No, it does not mean guarding our food, it means making sure that everyone is assured of getting enough to eat.

Pratik: But we are sure to get food every time we want to eat, aren't we?

Daddy: I must say, we are fortunate to get food when we need, but when you think of all the people, in the country and the world, not everyone is so fortunate and there is fear that more people may remain hungry.

Pranali: It sounds so sad, but why is it so daddy?

Daddy: That is because the climate of the Earth has begun to change and that may affect our food security.

Pranali: I have heard about climate change, but the weather keeps changing all the time. So how does it affect food security?

Daddy: I can answer your question, but I know someone who can answer better.

Pratik and Pranali: Who is that person, Daddy?

Daddy: That person is Ramesh uncle. He works in the observatory. While you two are helping mother, I will call him and ask if we can visit his office.

Pranali: Wow, that will be so nice!

Pratik: Oh, I am so eager to see an observatory!

Pranali: Yes, I am eager to see what all equipments they use in their work.

Change over interlude

Daddy: OK children, uncle has agreed and we are going to visit him tomorrow in his office.

Pratik and Pranali: Yippee! We are having an outing tomorrow! Is Mom coming also?

Daddy: Yes, of course! We all go to uncle's office first and then to his house which is nearby, it will be a family visit as well.

Interlude music

Sound of a car moving and then stopping.

Daddy: We have reached the observatory, let us get off. I can see Ramesh standing at the entrance, to welcome us.

Ramesh: Hello everybody! Welcome, I am glad to see you all.

- Daddy:** Our meeting was due for a long time and children wanted to know a few things about weather, so I thought this is best time to meet you.
- Pratik:** Hello uncle! Will you please explain how and why the climate is changing?
- Ramesh:** Yes, children, I will answer all your questions, it is important for all of us to know about climate change. Look at all these instruments around you. We use them to take observations on temperature, humidity, and wind velocity and so on.
- Pratik:** Uncle, why do we get rain only in the rainy season?
- Ramesh:** Different parts of the Earth get rain in different patterns, In India we have a distinct rainy season starting from June. First we have the South-West monsoon which gives rains for major part of the country and for a shorter period the North-East monsoon which gives rain to the South-East part of the country.
- Daddy:** Monsoon is so very important to our country because our agriculture depends upon rains to raise the crops. That means good monsoon is required for our food security.
- Ramesh:** That is right, there is a relation between rainfall and the crop cultivation. Places where the average rainfall is above 200 mm, crops like rice, sugarcane can be cultivated; in areas where rainfall is around 100 mm then wheat, maize or other coarse grains can be cultivated. Where rainfall is less than 50 mm the crops can be raised only if there is irrigation facility.
- Daddy:** Apart from that, crops also require certain temperature and humidity, length of the day and specific type of soil. Every crop has a specific season when it grows best, if the season is missed the crop does not grow well. Rice, wheat and maize are the three most important grain crops on which we depend for food. All three require different climatic conditions. Rice needs warm humid climate, wheat requires cold climate and maize grows well in warm dry climate.
- Mom:** How much of these grain quantity is produced in the world?
- Daddy:** Every year more than 250 crore tons of food grains are produced, raising these three crops world- wide, that comes to more than three hundred kilos per person on earth for each year.
- Mom:** That sounds sufficient, but then why are there people going to bed hungry in different parts of the world.
- Daddy:** That is because the production is not uniformly distributed, all countries are not self sufficient for food grains. Even if the food is produced, the prices are high. Food is not accessible to people with lower incomes. So we have to make sure that food is not only available but also accessible.

Mom: I heard that a lot of food material goes waste.

Daddy: That is true! In countries with humid and warm climate, insects attack stored grains and spoil them. Also, in damp conditions fungus grows on grains, making the grains useless for consumption, rodents also spoil huge amount of stored grains. Even if food is available and accessible, it should be nutritionally sufficient.

Pratik: Daddy do we have enough food grains in our country?

Daddy: Yes we do have! Lots of efforts have gone in making our country self sufficient in food. There were times when our country did not produce enough food grains, and we had to import from other countries.

Ramesh: There were long queues in front of the Public Distribution System Shops called ration shops.

Pratik: It sounds bad to me.

Pranali: And how did our country overcome these bad times?

Daddy: It was in the late fifties and early sixties of 20th century, our population was rising fast. It took a mammoth effort from our policy makers, scientists and farmers to make our country self sufficient. The change was so dramatic that it was aptly named “the green revolution”.

Pratik: So what is the problem now? We have enough in the market to go and buy!

Ramesh: The problem earlier was only for a few countries like ours’, now the problem is being faced by the entire world. The problem is that climate change will affect agriculture all over the world.

Pranali: I have heard about it, it seems it is going to make the ice caps on poles to melt and the level of seas is going to rise, but how is it going to affect agriculture?

Ramesh: You know the Earth has variety of climates ranging from very cold at the poles to hot and humid in the tropics. There is a range of temperatures, humidity, rainfall associated with each location. Our life styles, houses and agriculture are all adapted to the climate. For few thousand years this was the case, but that is all getting disturbed now.

Pratik: Why is that? Who is disturbing it?

Ramesh: The Carbon dioxide (CO₂) concentration in the air has gone up significantly. CO₂ from burning fuels and some other gases, known as green house gases, from industrial and vehicle exhaust get mixed up with the air and trap the heat from earth which should be allowed to escape into the space. As a result the earth has become warmer, this is called global warming.

Pranali: Uncle, you said different places on earth have different climates, so how do we know that the Earth is getting warmer?

Ramesh: There are observatories all over the world, they have been recording temperatures over the years. What has been noticed is that in many places higher and higher temperatures are being recorded and if you take an average the Earth has become warmer by almost one degree Celsius in the last one and a half century.

Pranali: Is that serious?

Ramesh: It is! What is more dangerous is that the warming was faster in the past few decades. In India, in many places, the maximum summer temperature is crossing 40 degrees Celsius.

Daddy: You know our average body temperature is 37 degrees Celsius, if the air temperature is above that it is dangerous to our health.

Mom: Is it dangerous to plants?

Daddy: Some plants such as rice and maize can tolerate this rise in temperature, but wheat is a cold loving crop, heat wave affects the crop in the field and if the heat wave is intense, all crops may suffer and grain production is reduced.

Ramesh: That is not the only way in which global warming affects, there may be extreme heat waves and cold waves, rains and storms may become more intense, rainfall may become erratic.

Daddy: Scientists have predicted that with the rise in temperature, crop damaging insects will become more active, they will be more hungry and will eat more crops. Estimates show that with every degree Celsius rise in average temperature, the increase in crop damage will be between 10 to 25%. Vegetables and fruits are even more prone to damage by fluctuations in the weather, pests and diseases.

Pratik: Does that mean that we are going to have food shortage?

Daddy: Well, we hope not! But we have to act fast, if we have to avert the dangers of global warming.

Ramesh: Most world leaders are convinced that global warming is a reality and human activities are a major contributor to it. In the Paris agreement of 2015, the world leaders resolved to cut down on green house gas emissions, unfortunately, in 2017 the US has withdrawn from it.

Mom: Does that matter?

Ramesh: It does, because the US is the second biggest polluter after China. As per 2015 numbers, every American is responsible for more than four times CO2 emissions

as compared to an Indian. In the Paris accord it was decided to reduce green house gas emission so that the global warming in future can be kept below 2degrees Celsius. If the US does not keep its commitment, others will have to work harder to keep the target in sight.

Daddy: Do nations have an option to withdraw?

Ramesh: Countries had submitted Intended Nationally Determined Contributions or INDCs, which means how they will go about reduction of green house gas emissions, unfortunately it is not a legal binding.

Pranali: If it is so important, all countries should reduce green house gas emissions.

Mom: It means people have to do something! Isn't it?

Ramesh: Yes, the governments can make policies and rules but ultimately it is the people all over the world who have to work for it.

Daddy: That is the reason why our government is putting a lot of emphasis on generation of electricity using renewable resources such as solar and wind. That will reduce use of coal for power generation.

Pratik: I heard that very soon electric cars (E-cars) will be on the roads.

Daddy: Yes, soon there will be E- cars and also cars using petrol or diesel mixed with alcohol or biodiesel made from agricultural produce. That way we can lessen the carbon that is coming from fossil fuels and recycle the carbon which is already there in the atmosphere.

Pranali: Are you talking about biodiesel?

Mom: Yes, when we use biodiesel the CO₂ which is in the air is being reused, not like fossil fuels where carbon from below the earth is burnt and more CO₂ is added to the atmosphere.

Daddy : Countries have to devise their means of adding zero carbon to the atmosphere and then actually start reducing the amount that is in the air.

Pranali: How can we reduce CO₂ in the atmosphere, can trees use it up?

Ramesh: Yes, trees can help, but experts are of opinion that there isn't enough area on Earth to plant so many trees, to bring down the CO₂ level. That may be true, but it will certainly do a good job. If we generate less CO₂ and grow more trees to consume it, it is bound to reduce CO₂ in the atmosphere.

Pranali: So has our government started doing that?

Daddy: Yes, the government has started forestation programme to increase the forest cover in the country. Besides that the farmers are told not to burn the crop residues, and dry grass on the hills. Citizens are prohibited to burn garbage and advised to recycle it.

Ramesh: Let us now go to my residence, my wife must be waiting for us, we can keep talking on the way.

They all start walking towards Ramesh's residence.

Pranali: How can we participate in this process of reduction of green house gases?

Ramesh: There are many things which you can do. Save fuel and energy, practice reuse and recycling, use more local materials and foods, use more plant based foods.

Pranali: Will that make sure that there will be food for all.

Ramesh: Calculations show that right now there may be enough, but it is not evenly distributed. The real challenge is ahead, the world population is rising, land and water resources are on decline and climate is deteriorating. It is hard to predict what is ahead of us.

Daddy: Yes, earlier some people did not want to agree that climate is changing for the worse, they argued that higher CO₂ will be good for plants. In recent experiments scientists found that grains from rice plants grown in high CO₂ were nutritionally inferior. The grains had lower protein, vitamins and minerals.

Mom: So climate change is going to reduce food grain production and whatever will be produced will be of lesser quality.

Pranali: So how can this be avoided?

Daddy: Scientists all over the world are trying to develop new varieties of crops which can withstand either fluctuations, like heat wave, cold wave and drought. Scientists are also developing varieties which are tolerant to pests and diseases, so that in face of climate change the crop yields will be stable.

Ramesh: Just producing food is not enough, it has to be protected from loss during storage and transportation. New techniques are being developed to preserve the food to avoid losses in quantity and quality.

Mom: We can save on resources like electricity, water and cooking gas because during their production green house gases are generated. I tell my friends not to do wasteful cooking, gone are the days when people took pride in cooking dishes which took hours of heating. In the present situation it is a misuse of energy.

Ramesh: You are right Bhabhiji, our aim should be to use minimum resources and energy and generate minimum waste. It is also important to use agricultural technologies such as cultivation in regulated climate using poly houses and efficient irrigation systems.

They have reached Ramesh's residence. Ramesh's wife Radha is inside the house. Ramesh addresses his wife from the entrance.

Ramesh: Radha dear! We are home!

Radha: Welcome all; I have been waiting for you. Let us have some snacks while they are fresh and hot.

Mom: Radha, you have cooked so many dishes, you shouldn't have taken so much trouble.

Ramesh: Oh, she loves to have guests at home, and she practices what we were discussing so far. These eatables are made from fruits and vegetables from our garden with organic manure from kitchen waste and cooked on biogas. All our vegetables are home grown and we in our own way are contributing to the food security.

Mom: That explains why you two look so fit, active and happy!

Dad: May your garden flourish so that we can come often and enjoy the healthy and tasty snacks.

Ramesh and Radha: You are always welcome; it will be a pleasure for us.

Every one laughs. End music piece.