

Episode –8
OCEAN, ATMOSPHERE INTERACTION AND LIFE

Research & Script- Dr. Anurag Sharma

(Morning scene)

Suryaprakash: Vasudha...Vasudha... Manav and Srishti, where are they? Are they still asleep? Has Vivek reached the station or not?

Vasudha: (Loudly) Manav...Srishti...Get up!

Manav: (Lazily) Mummy, its Sunday, I don't want to get out of bed

Srishti: (Lazily) Mummy...Papa screams so loudly

Vasudha: he is screaming because it is already 9 o'clock and both of you are still in bed. Now get up and brush your teeth

Srishti: Mummy where is Vivek bhaiya?

Vasudha: He has gone to receive your Papa's college friends, Dr. Brij Mohan, his wife Dr. Alpana and their close friend Dr. Shamshul Islam.

Manav: (Whispers) Dr. Shamshul Islam..means Islam Uncle, who used to scold me now and then. He.. he is coming. Why?

Vasudha: Manav, this is no way of talking. And you were very small at that time always bothering Islam Bhaisahab that's why he used to scold you. Now you are quite a disciplined child.

Srishti: (laughs) Manav and disciplined child? Arrey Mummy, earlier Islam uncle used to only scold him, now your disciplined Manav is only good for thrashing(laughter)

Manav: (boringly) but why are they all coming?

Suryaprakash: Arrey bhai.. now all three of them are well known Ocean and Climatologists of our country. Do you know Dr. Islam has visited Antarctica three times?

Manav; Okay ..Okay Papa..All this is very good, but why are they coming to our house?

Vasudha: (loudly) Quiet Manav, if you utter another word like this you will get a tight slap from me! Guests are coming and you should be happy for that. Why are they coming is none of your business. Now go to the bathroom!

Srishti: (laughs) wah wah, a very good morning to Manav(laughter)

Suryaprakash: Actually Manav beta Dr. Brij, Dr. Alpana and Dr. Islam are coming to Delhi to give a lecture on Oceans and Environment. As the auditorium is close to our house, I asked them to stay with us. They will be staying with us for 6-7 days.

Manav: (terrified) Islam Uncle will also stay for a week?

Srishti: (laughs) And you will get your peace of mind for a week (laughter)

Suryaprakash: (laughs) no no no ... it won't be like this. Last time when Islam visited us you were only 4 years old and poor Shamsul was really very disturbed about his Antarctica mission at that time.

Srishti:Papa you remember, Manav painted on all the important letters and documents of Islam uncle ?(laughter)

Suryaprakash: (laughs) that's why Islam scolded him. Poor Manav, after making paintings on Islam's documents he went to Islam only to get appreciation for his rare talent. (Everybody laughs)

Manav: I got scolded and you all are laughing?

Vasudha: manav don't feel sad, your Islam uncle really loves you. After scolding you he brought many toys for you/

Srishti: (laughs) And he opened all the toys and did their post-mortem in front of Islam uncle only (laughter)

Suryaprakash: All of my three friends, they really like you all. You know Dr. Islam wanted to stay with us only and he was asking about you Manav?

Manav: O my God! He still remembers me? I must quickly have a bath before he comes. I should look clean and a disciplined boy in front of him.

Vasudha: That's really good, because of Islam bhaisahab he is even ready to take an early bath on a Sunday morning.(laughter..change over music)

(Sound of a door bell)

Suryaprakash: I think they have come. Manav..Manav.. Please open the door.

Vasudha: Manav won't open the door. He is so terrified of Islam bhaisahab that he is sitting in his room with all his books open.

Suryaprakash: (laughs) okay I'll open the door

(opening of door)

Suryaprakash: Welcome...welcome !! Brij, Alpana, Islam... how are you? We are meeting after so long.

Namaste bhabhi..This is my wife and colleague Dr.Alpana

Alpana: Namaste bhai sahib, namaste bhabhi

Islam: Surya, your Vivek is really intelligent. The coolie was over-charging and trying to cheat us. But Vivek handled the situation and paid him the right amount.

Suryaprakash: Dr. Islam..That's why we call him Vivek..which means wisdom (laughter)

Vasudha: Please come, breakfast is ready(sound of utensils)

Islam: How are you Srishti?

Srishti: I am fine, thank you uncle.

Islam: Suryaprakash, you had a really a little brat in your hose. What was his name? yes Manav. Where is Manav?

Vasudha: (laughs) Manav...Manav Come Islam uncle is calling you.

Srishti: Uncle Manav still remembers your scolding.

Islam: But that was five years ago. Okay I'll call him myself.(loudly)Manav Manav!!(sound of someone running)

Suryaprakash: here is our Manav

Manav: (slowly) Namaste uncle..namaste Aunty..

Islam: Arrey wah, Manav has really grown up now. Come Manav come here.

Manav: Yes uncle

Islam: So young man.. which class are you in?

Manav: Uncle I am in class four

Alpana: Very good, Manav has really grown up (laughter)

Vivek: Uncle you have a lecture on Ocean and environment, isn't it?

Brij Mohan: Yes Vivek. Alpana and myself shall speak on environment and Dr. Islam will address on the close coordination between Oceans and environment

Manav: Interaction between Oceans and environment? What interaction?

Islam: (laughs) it seems that I have to start my lecture from today itself.(laughter)

Alpana: Okay let's have breakfast first and then we will answer all your queries

Brij: And one more thing Manav, as long as we are here, you have to ask atleast four questions daily. Okay Manav?

Manav: Yes Brij Uncle

Islam: Lets finish breakfast quickly. And Manav you can think some of the questions(change over music)

Srishti: So uncle you were telling that there is interaction between ocean, sea, atmosphere and land.

Islam: Yes Srishti, Okay let me ask you a question. Can you tell me the three major systems that make this Earth a living planet?

Manav: Systems? What systems uncle?

Brij: (laughs) Beta Manav, we are talking about those systems that help in making life possible in this blue planet. The systems that you think are very important for sustaining life on this planet.

Srishti: Brij Uncle, I think that three very important things for life are air, water and food

Manav: Absolutely right Didi, I also think that without air, water and food life will not be possible on this planet.

Alpana: Srishti, as a lay man what you have said is perfectly correct, but as a scientist when we study the changing climate, whether system, plants, environment, temperature as a physical unit, then we broaden our approach a little bit to make the various phenomenon and system clearer to us.

Vivek: Alpana Aunty, according to me, there are three major systems on this Earth, ie. land system, ocean system and atmosphere system.

Islam: Very good Vivek! You are absolutely right. Now listen Srishti and Manav, what you said was also right but Vivek broadened his approach and thought of a bigger system. Like air is atmosphere, water is ocean and habitat and food is land according to Vivek, and this is the scientific approach.

Alpana; Vivek you really made a very good point although habitat and food is also available in water that's why land has e very important and a new role in scientific studies.

Manav: What role Alpana Aunty?

Brij: (laughs) we will explain it to you Manav, but keep thinking of newer question. Okay(laughter)

Islam: Listen, as Vivek and Dr. Alpana told you land, ocean and atmosphere are the three major systems of Earth and because of the interaction between these three systems we get new weather, food material and life

Brij: That means we as scientists look at this planet as a very fascinating system that consists of many sub systems and processes and all these physical parameters coordinate and combine together to make this amazing living planet.

Alpana: What we mean to say is that there is a continuous interacyion between various systems and because of this we have breeze, storms, rain and cyclones.

Manav: But how Aunty?

Islam: Okay Manav, I think you should first try to understand these three systems separately, then you will be able to understand their interaction very easily...and Manav bring any book or a copy of your school.

Manav: (slowly) Why Islam uncle?

Islam: Why ... because you made drawings on my Research paper so I will explain everything by making drawings on your books and copies (laughter)

Manav: Mummy !!!

Vasudha: (laughs) What Islam bhaisahab, poor Manav has been working so hard to hide his fear but you are still pulling his leg

Islam: (laughs) Okay Manav, forget about books and listen carefully. But if you are unavle to understand then tell us without any fear

Alpana: from the past few decades while studying the complexities of various systems on Earth, scientists have come to a conclusion that atmosphere, ocean, land and even living things including man are closely connected to each other by a very critical balance, and activity of any component has the ability to affect each and every system.

Manav: (amazed) Connected to each other? I have never seen any connection (laughter)

Islam: Manav, this connection is through that wire that we cannot see but we can always feel it

Manav; How?

Vivek: Now look Manav, I take you for a ride on Papa's scooter and you really enjoy it. Isn't it?

Manav: Yes Vivek bhaiya

Vivek: But nowadays you feel very hot and the scooter also plays a role in making the climate warmer

Manav: What? What has the scooter got to do with the warm climate?

Alpana: Scooter, car, bus, factory they all emit many gases which warm our climate.

Srishti: So Manav, this unnecessary ride on scooter with Vivek bhaiya is really harming our environment

Suryaprakash: exactly Srishti, so Manav this is the invisible thread that is holding us together, and even a small imbalance can break the lifeline of this planet. Got it?

Manav: a little bit, Papa

Islam: okay let's explain you in detail. We'll start with atmosphere. Manav you must be aware that Delhi is very far from the sea. Do you think that these ocean and sea have any role to play in your life?

Manav and Srishti (together): No uncle

Alpana: But children that's not true. Ocean and atmosphere are studied as a single unit because they are closely related through many common interactive activities and transfer of heat within them

Islam: Yes children, both the ocean and the atmosphere get the energy from the Sun for the movement within them

Brij: Because of difference in the heat there is a difference in the density and pressure and this difference is the base of air and oceanic currents

Vivek: Uncle these oceans play the role of a storing tank of heat coming from the Sun, isn't it?

Brij: Yes Vivek, and also these oceans get heated to a greater depth in comparison to land

Alpana: and when the cold air comes in contact with this hot water then this heat is released in the atmosphere. The air which is blowing over the ocean causes waves and during this interaction, air takes moisture from the ocean and also temperature characteristics of the ocean

Suryaprakash: Manav... are you understanding anything?

Manav: Yes I think so

Islam: you think so? What an answer is this

Brij; I think for the sake of Manav we have to go very slowly

Alpana: Okay Manav, as you must be knowing that atmosphere is a blanket of gases that are surrounding the whole Earth

Islam: Whwn the radiation coming from Sun enters the Earth's atmosphere then some of it is reflected from clouds and dust particles back to space and the rest reaches the earth's surface

Alpana; Those radiation that are heading towards the Earth's surface reach the surface, then some of the radiation is absorbed by the Earth and the rest is reflected by ice caps, ice sheets and other reflective surfaces back to the space. The radiation that reaches the surface of the Earth change its wave length ie. it becomes lone wavelength radiation and in the form of infrared radiation, the Earth transmits heat

Brij: In our atmosphere, there are some gases which because of some special characteristics do not allow these long wave infrared radiation to escape and absorb their heat. By this process, these gases increase or maintain the temperature of our Earth

Islam: This has been happening since the history of this planet. This is known as the green House effect. Without atmosphere and green house effect the Earth will become ice cold and there won't be any life on this planet

Manav: now I got it Islam uncle and I think I should go and play now

Islam; No..no..no..Manav you can't go, I have to settle many scores with you

Brij; And you have not asked any single question from us

Srishti: Poor Manav there is no escape for him now (laughter)

Manav: uncle you have explained everything so well, there is no question to ask (laughter)

Islam: Beta Manav, we have not explained anything now. We have to begin explaining now

Suryaprakash: Manav, it is quite rare to ask a question and get the answer at the same time. That's why never let these opportunities go. Ask as many questions as possible

Manav: Okay Papa. Uncle, why do people call the unit of measuring speed in sea, a knot?

Brij: Very good, you have an interesting question. Bhabhi, lets have a cup of tea for such an interesting question

Vasudha: Yes Bhaisahab

Alpana: Okay Manav now listen to the answer os your question that why we call the unit of measuring speed in water a knot. It is because of the method adopted by the early sailors to measure the speed of their ship

Brij: Actually, in olden days, sailors had rope which had a knot at every 14.4 metres, and one end of that rope was attached to a big log of wood. Sailors used to throw this log along with one end of rope attached to it in the sea.

Islam: This log pulled the rope along with it and the sailors counted the number of knots pulled by this log in 28 seconds. With this they were able to know the speed of their ship. That's why the speed of ship is measured in knots

Alpana; Today one knot is equal to the speed of 1.85 kms per hour. I think now have got the answer to your question

Manav: Yes Aunty!

Suryaprakash: (laughs) Manav you are scared of Islam Uncle unnecessarily. See how many interesting things

Manav: Yes, Papa

Islam: (loudly) Manav don't be too relaxed. After finishing with these explanations I will draw on your books

Manav: Mummy !! (laughter)

Vivek: Islam Uncle, there are different types of gases at various levels of atmosphere and because of these gases there is a balance between energy absorption and energy release. Is it true?

Islam (sipping tea) Yes Vivek, if we look at the composition of air around us, it contains mostly nitrogen which is around 79%, oxygen around 20% and Argon, carbon dioxide and other gases make the remaining 1% of composition. Another very important composition of the atmosphere is water vapour and you know water vapour is also one of the major green house gas?

Alpana: There are many green house gases that are present in a very small quantity in the atmosphere. They are measured in parts per billion ie. ppb.

Srishti: This is a very very small quantity aunty. Do these gases have any effect on our environment in such a small amount?

Brij: Yes Srishti. Although these gases are present in trace amounts, yet they do have many important role to play. One of the trace gas which is very much studied nowadays is carbon dioxide gas.

Islam: The present level of carbon dioxide gas is around 0.034 % and in such a small percentage it is able to cause quite a major warming of our planet.(sound of bell)(door opening sound)

Vasudha: Mrs. Malhotra? Welcome. Bhai sahib this is Mrs. Malhotra our neighbour

Mrs. Malhotra: Namaskar

Suryaprakash: Please come in

Mrs. Malhotra: Actually I just came to see Manav, today he didn't come out to play with my son Happy so I was worried. Is everything okay?

Srishti: (laughs) aunty all is well, its just that Manav is busy with some important discussion

Vasudha: Actually. Mrs. Malhotra, Dr. Islam, Dr. Brij and Dr. Alpanan are college mates of Manav's Papa. They were sharing some interesting facts about atmosphere and ocean.

Mrs. Malhotra: So you all are doctors, then why are you talking about sea and ocean and atmosphere is really bad here.

Suryaprakash: (laughs) Actually they are not the doctors who treat diseases, they are the scientists researching on ocean and atmosphere.(pause)Why don't you also join us, have some tea with us

Mrs. Malhotra; Certainly Bhaisahab, but Vasudha I will take little bit more sugar inmy tea(laughter)

Srishti: Uncle nowadays people are also talking about methane along with carbon dioxide gas

Islam: Yes, Srishti methane is also a very important green house gas, and a major reason for increase in its level is increasing human population

Mrs. Malhotra: You are right Dr. Islam, these humans are really a menace. Earlier we had cleaner gardens, lots of quiet and lonely places with lots of birds. Now everywhere there are humans, I think we should do something urgently to stop this growth of human population

Srishti ; (laughs) Aunty don't forget we are also a part of this human population

Mrs. Malhotra: So what ? I am happy with Mr. Malhotra and my family of six, 3 daughters and my son Happy (laughter)

Brij: Actually along with human population the number of livestock is also increasing and because of intensive farming, especially because of paddy cultivation methane level is rising

Alpana: Earlier the methane level was 0.003% but now it has increased to 0.018%. Similarly, level of carbon dioxide gas in the beginning of eighteenth century was 0.028% and today's is around 0.034%

Vasudha: Here Mrs. Malhotra, your tea

Mrs. Malhotra: Thank you Vasudha (pause) Dr. Sahab what will happen with such a little increase in the level of these gases. Now you add three spoons of sugar or two and half it will taste the same

Islam: (laughs) Malhotra bhabhi to know the effect you must sit with us daily. We are just talking about atmosphere now but later when we talk about the interaction within various systems then you will be able to understand the difference between three spoons and three and a half spoons (laughter)

Mrs. Malhotra: Oh it will take a long time. I have to prepare lunch for Malhotra sahib and Haapy. They only like paranthas made by me

Brij: No no don't worry. We will not discuss all issues today itself, but certainly later on we will talk about how forests act as a store house of carbon and moisture and how sea creatures and water absorb carbon

Alpana: Atmosphere has a major effect on the great oceanic movements and oceans give major characteristics to atmosphere

Islam: yes the nature and characteristics of atmosphere is dependent on the ocean. The source of energy of lower atmosphere is ocean itself.

Brij: Rain. Storms, cyclones all are due to the interaction between the ocean and atmosphere. Okay Manav, you can go and play with Happy now. Tomorrow, you and your friend Happy have to ask some questions

Islam: Come Suryaprakash let's go in the lawn. I am tired of sitting and after that I have to make drawings on Manav's books

Manav: Mummy!!!

Islam: Okay Mrs. Malhotra we will meet tomorrow and do lots of talking (laughter)

Mrs. Malhotra: Okay ji. Actually me Happy knows many things about oceans

Alpana: good tomorrow we will meet him

Suryaprakash: Come Islam and Brij, lets go outside. Vivek you may also join us. (sound of footsteps)

Srishti: Mummy Islam uncle and Brij uncle know so many things

Vasudha: (laughs) Yes and also your Alpana Aunty is so full of knowledge

Manav: Mummy Islam Uncle will spoil my books , what shall I do?

Alpana: That we shall decide later, now you go and play outside (laughter)

Mrs. Malhotra: Okay Vasudha, I will also make a move. Tomorrow I will bring along Happy also. Okay Srishti, okay Alpana ji, bye

Together: Bye...Bye...